



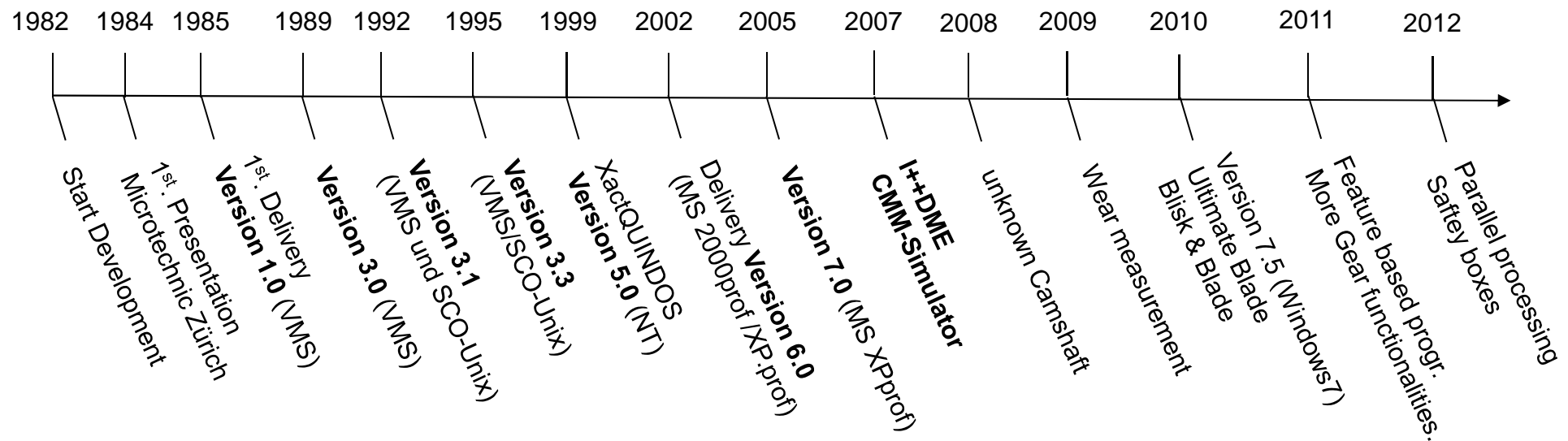
**HEXAGON**  
METROLOGY

**QUINDOS**  
the  
*Analysis tool*  
*for Metrology*

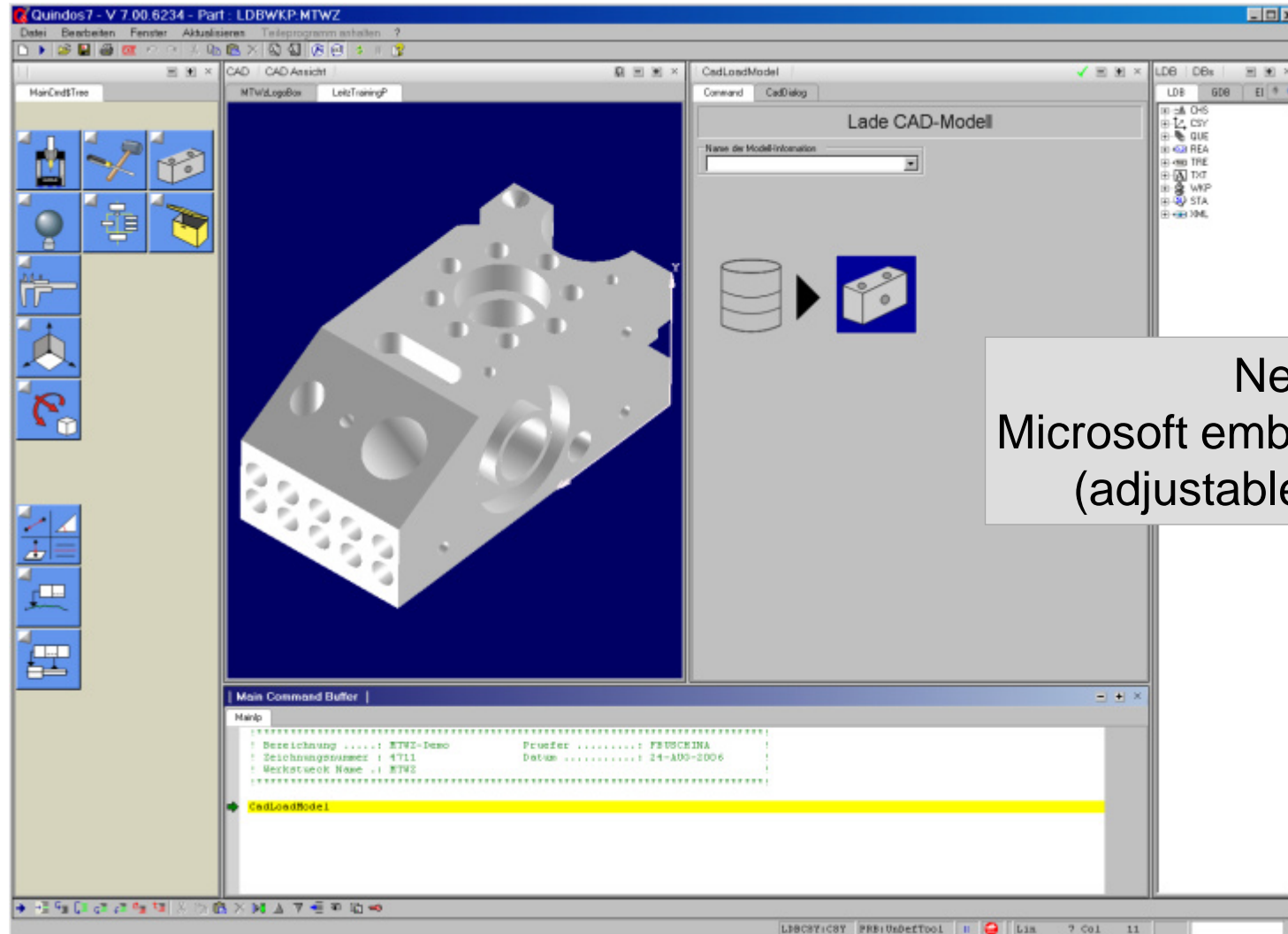
# QUINDOS®

## PowerTrain Solutions

- the only upwards compatible metrology Software since 1985 (from VMS/ALPHA-VMS/SCO-UNIX/NT/WINDOWS 2000prof./XPprof./ VISTA operating platform till Windows 7 Ultimate)
- Part programs from Version 1.0 will run on Version 7.6

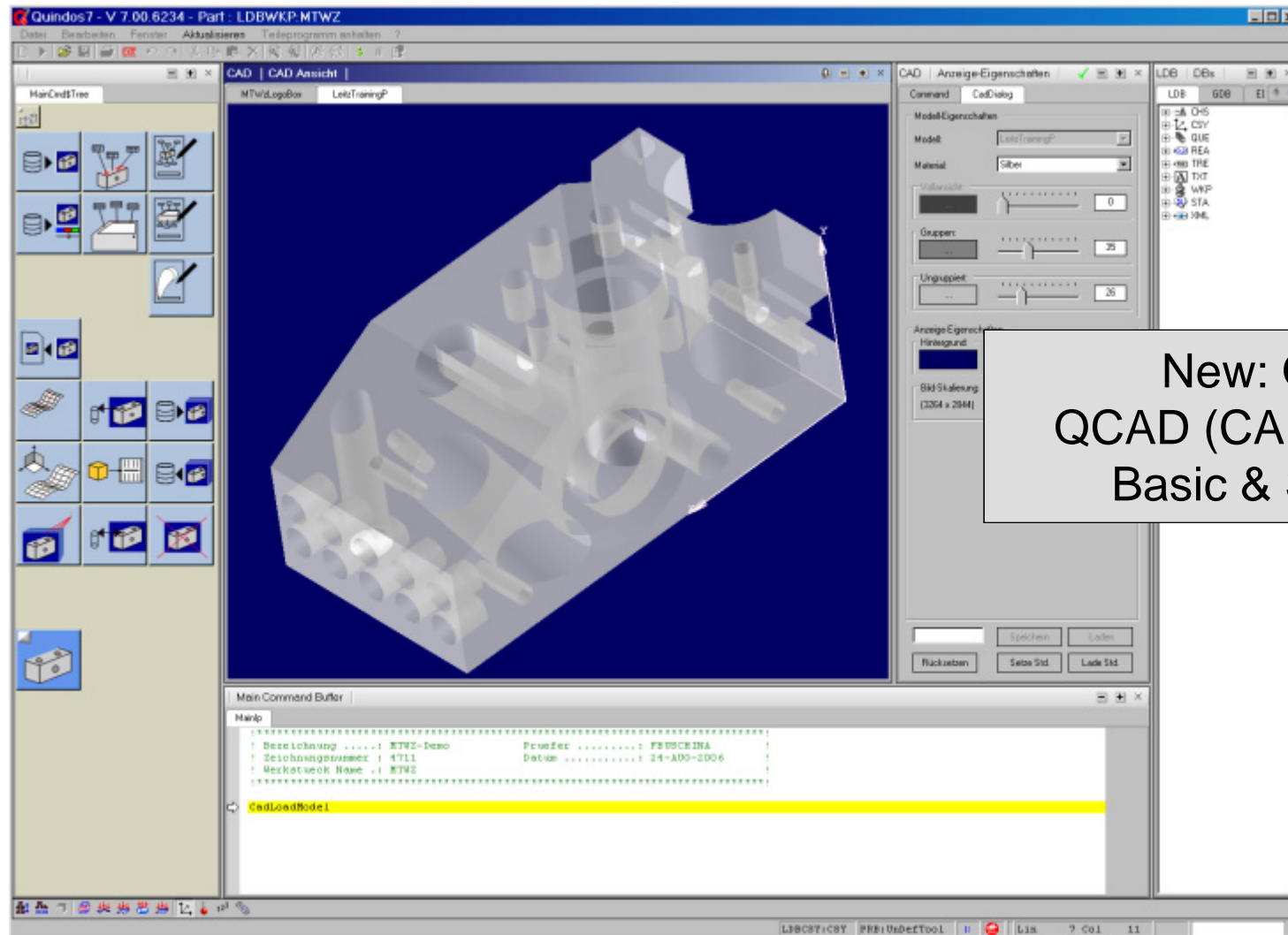


## PowerTrain Solutions



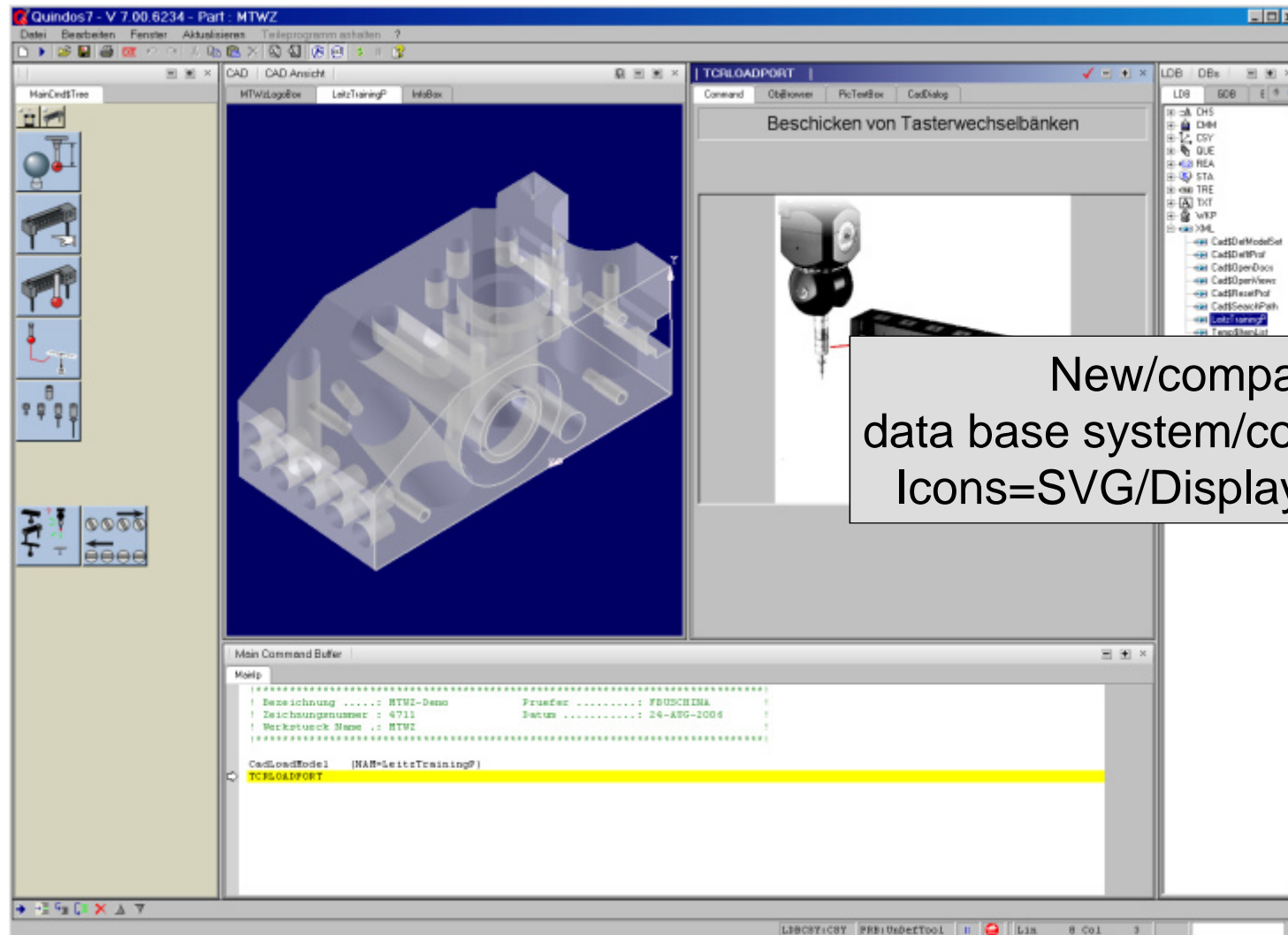
New:  
Microsoft embedded surface  
(adjustable windows)

## PowerTrain Solutions



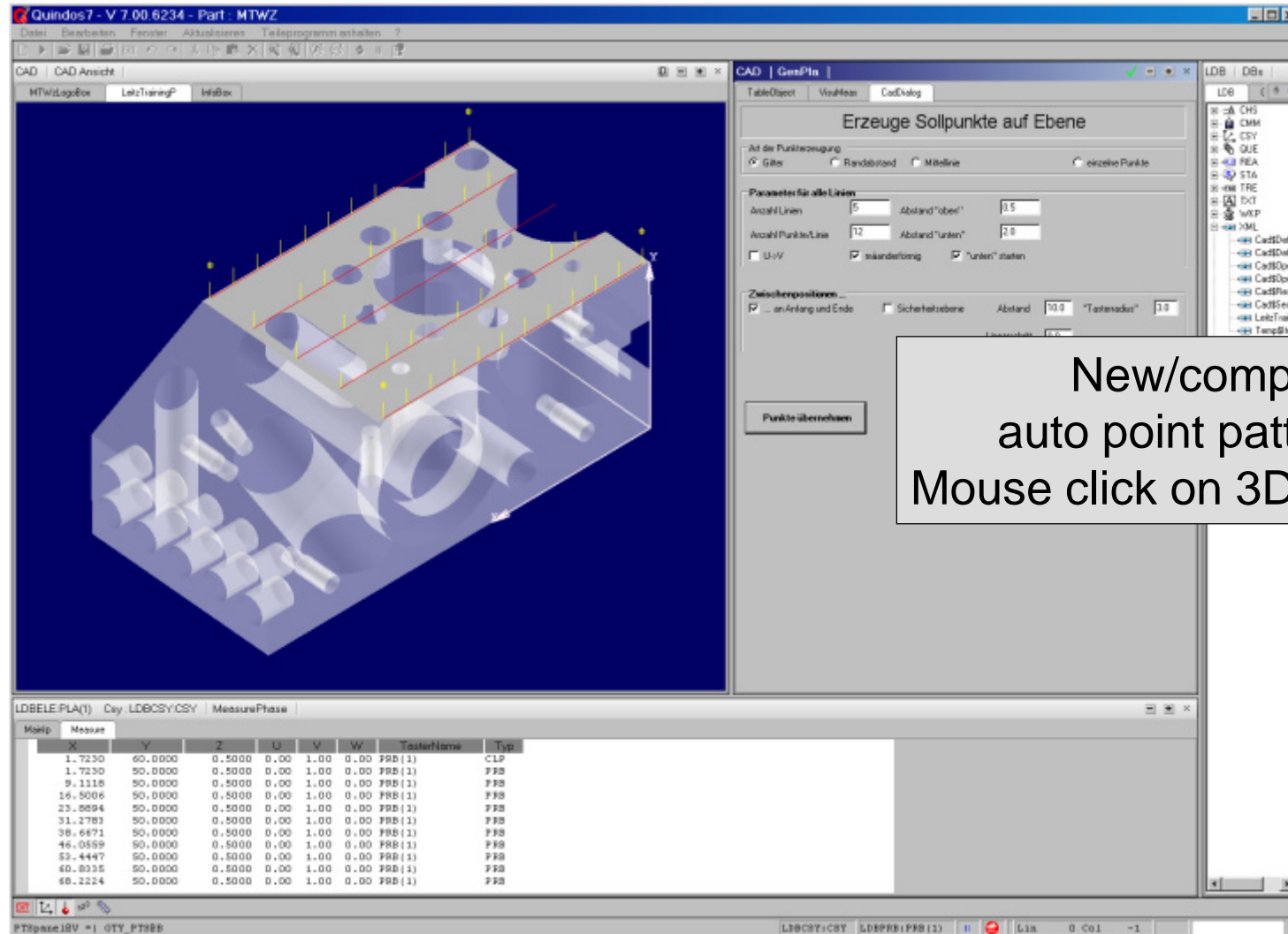
New: Option  
QCAD (CAD interface)  
Basic & Surfaces

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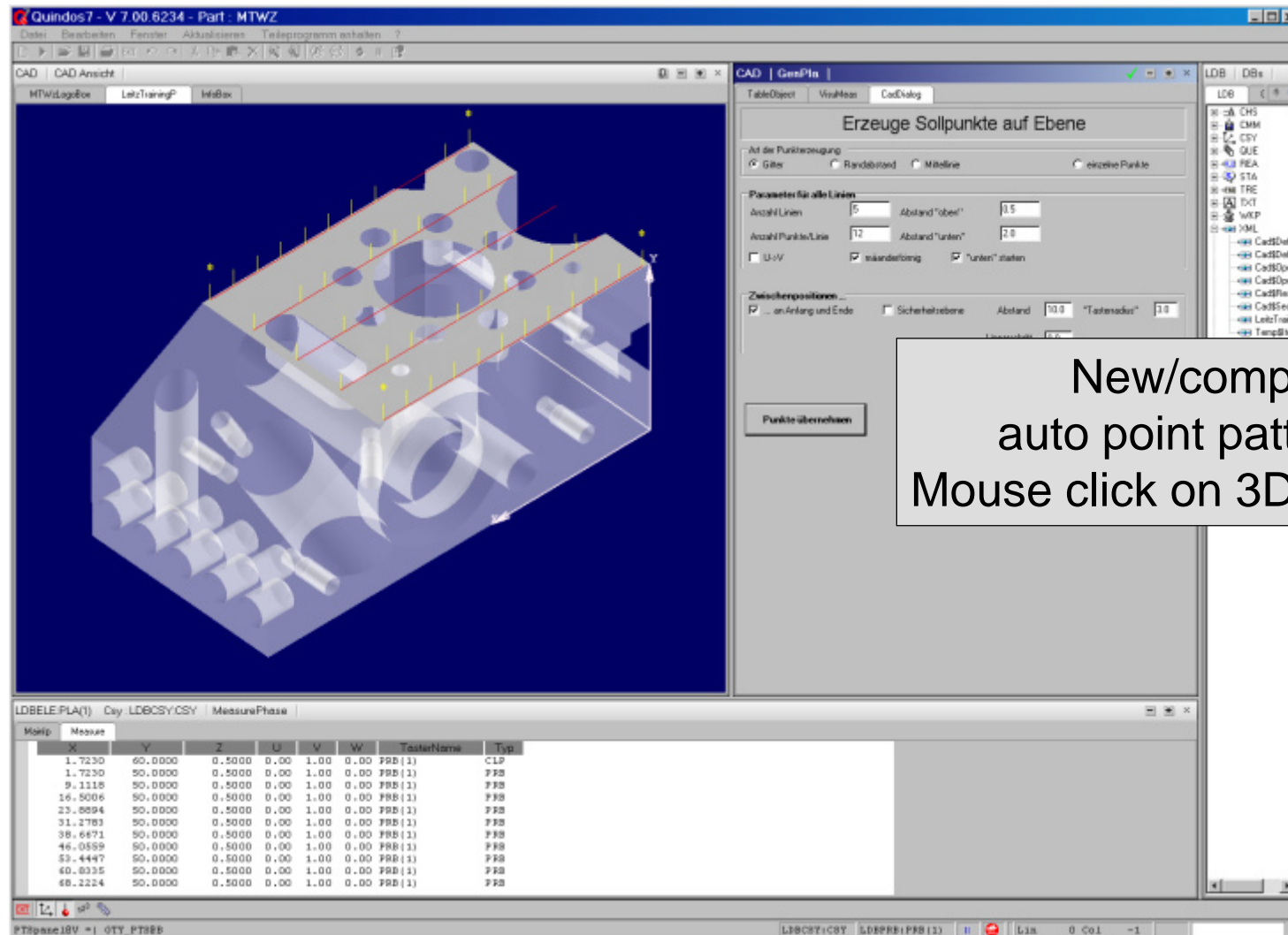
New/compatible:  
data base system/command buffer/  
Icons=SVG/Displays=Dialogues

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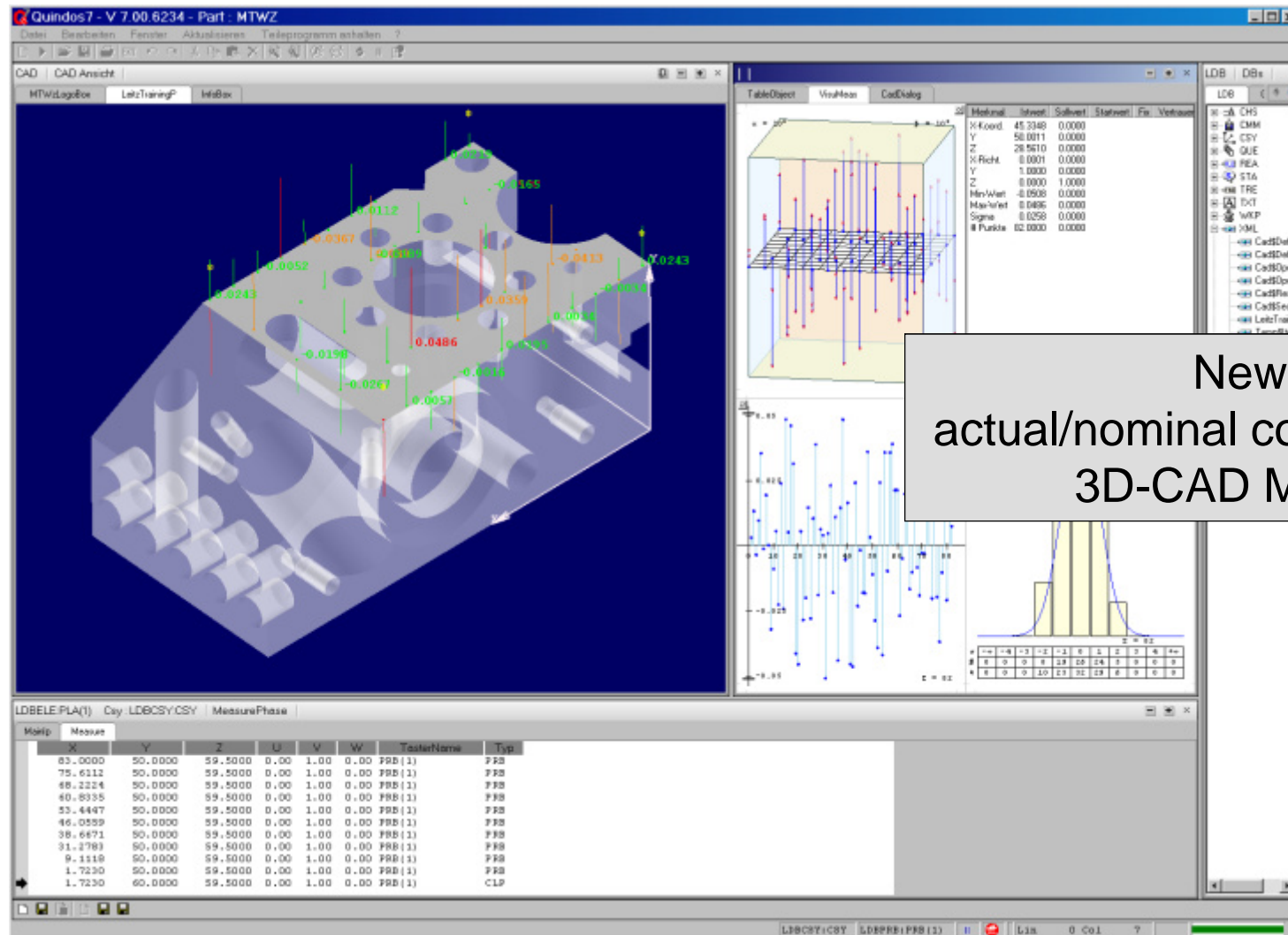
New/compatible:  
auto point pattern or via  
Mouse click on 3D-CAD MODEL

PowerTrain Solutions



New/compatible:  
auto point pattern or via  
Mouse click on 3D-CAD MODEL

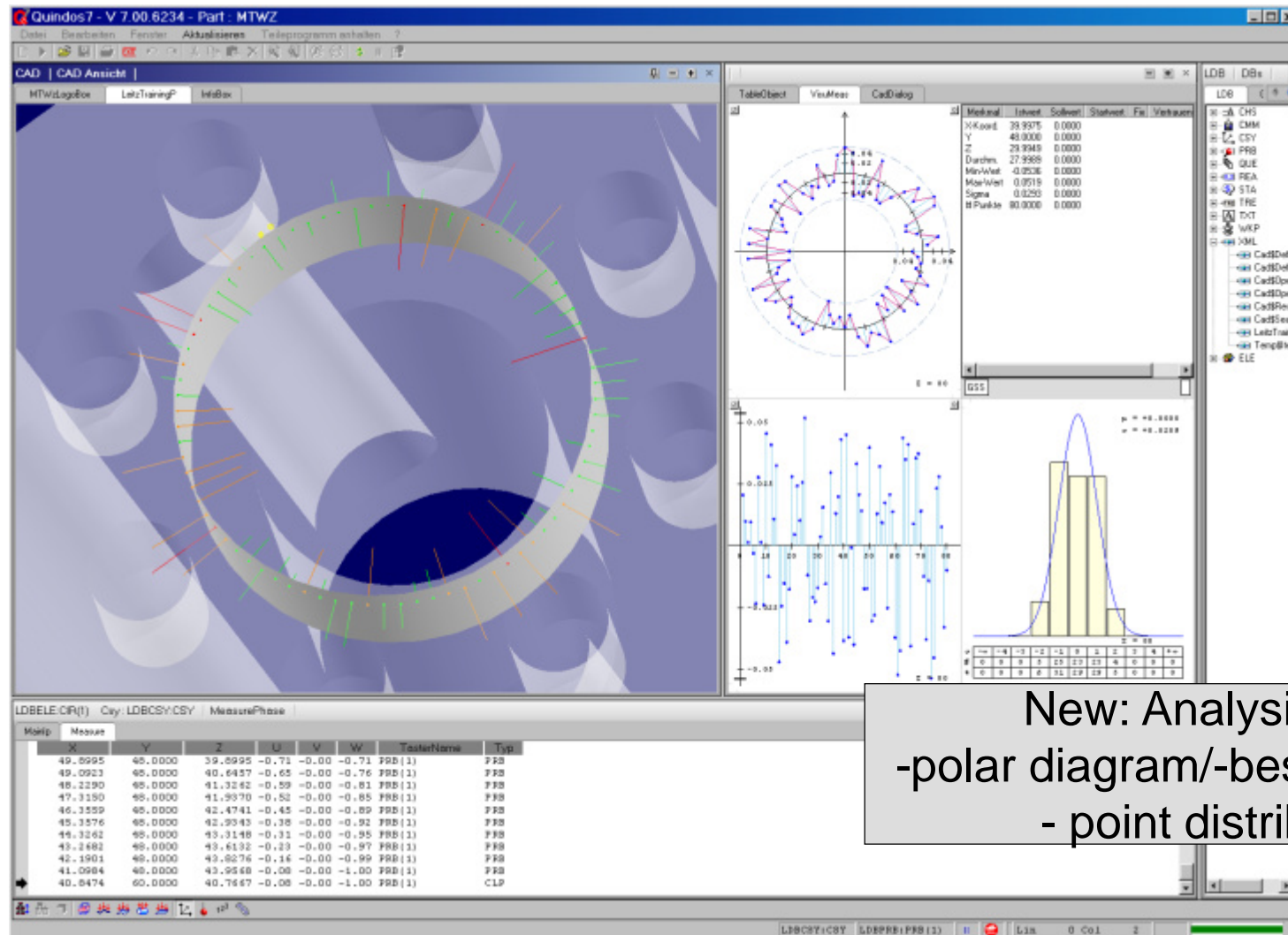
PowerTrain Solutions



New:  
actual/nominal comparison on  
3D-CAD MODEL



PowerTrain Solutions



New: Analysis tools  
- polar diagram/-best fitted points  
- point distribution

PowerTrain Solutions

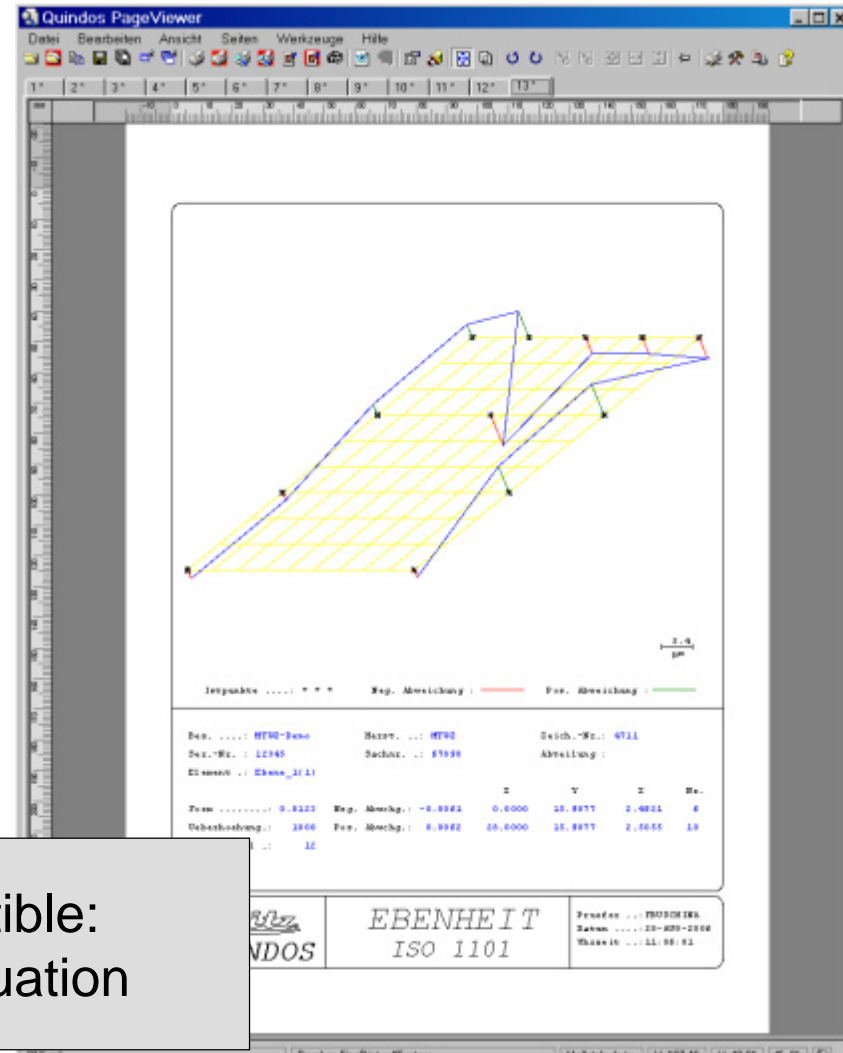
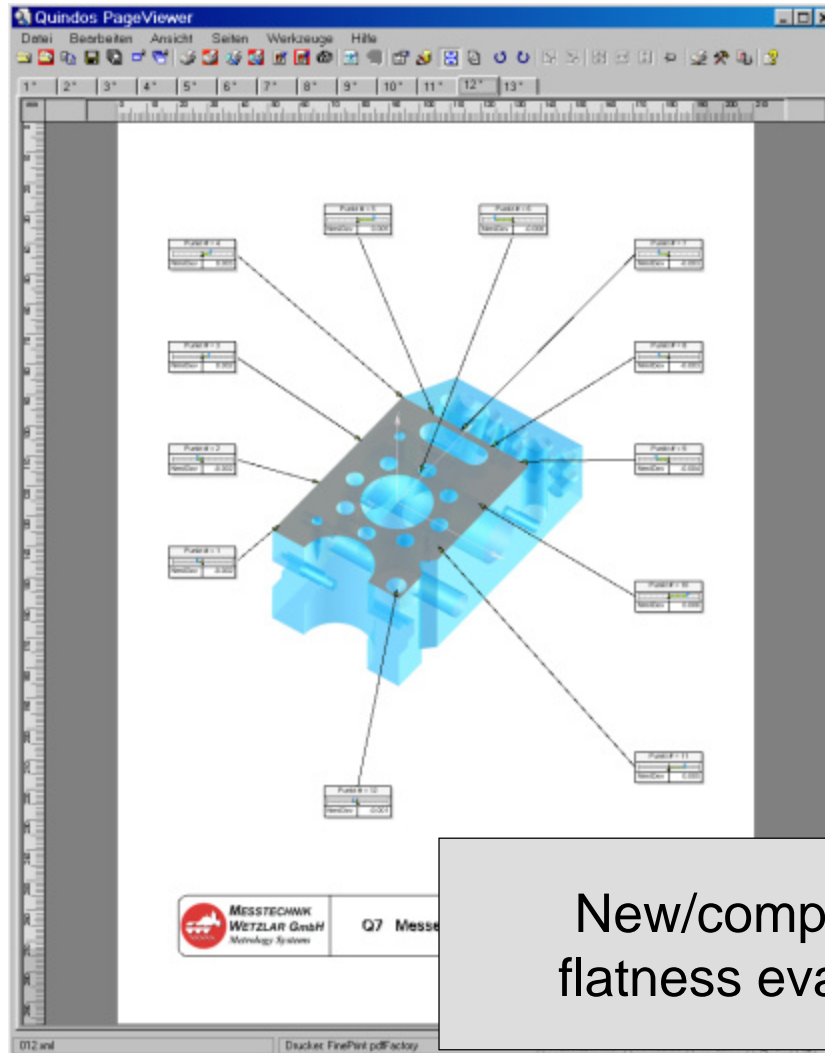
The screenshot displays the Quindos7 CAD software interface. The main window shows a 3D model of a gear with several measurement points marked in red and green. A 'Werte Messpunkte aus' (Values from measurement points) dialog box is open on the right, showing settings for 'Stacheln verbunden' (Spikes connected) and 'Jeder... Punkt' (Every... point). Below the dialog, a table lists the coordinates and names of the measurement points.

Maßp.	X	Y	Z	U	V	W	MaßpunktName	Typ
49.0995	40.0000	39.0995	-0.71	-0.00	-0.71	FRB (1)	FRB	
49.0923	40.0000	40.0437	-0.65	-0.00	-0.76	FRB (1)	FRB	
46.2290	40.0000	41.3242	-0.59	-0.00	-0.81	FRB (1)	FRB	
47.3250	40.0000	41.3970	-0.52	-0.00	-0.85	FRB (1)	FRB	
46.3559	40.0000	42.4741	-0.45	-0.00	-0.89	FRB (1)	FRB	
45.3576	40.0000	42.9343	-0.38	-0.00	-0.92	FRB (1)	FRB	
44.3262	40.0000	43.3148	-0.31	-0.00	-0.95	FRB (1)	FRB	
43.2682	40.0000	43.6132	-0.23	-0.00	-0.97	FRB (1)	FRB	
42.1901	40.0000	43.8276	-0.16	-0.00	-0.99	FRB (1)	FRB	
41.0984	40.0000	43.9568	-0.08	-0.00	-1.00	FRB (1)	FRB	
40.0474	60.0000	40.7647	-0.00	-0.00	-1.00	FRB (1)	CLP	

New:  
actual-nominal comparison  
on CAD Model



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New/compatible:  
flatness evaluation

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The screenshot displays the Quindos7 V 7.00.6234 CAD environment. The main window shows a 3D model of a complex mechanical part. A 'Messe Kreis' (Measurement Circle) dialog box is open, showing a circular measurement tool with three red dots on its circumference. The dialog includes fields for 'Element' (CIR(1)), 'Koordinatensystem' (CSY), and options for 'Modus' (Messen, Berechnen), 'Projektion in', and 'Berechnungstyp'. A 'Main Command Buffer' window at the bottom shows the following command sequence:

```

Main Command Buffer
Mosp
-----
| Bezeichnung .....: MTWZ-Demo           Pruefer .....: FBUSCHINA
| Zeichnungsnummer : 4711                Datum .....: 24-10G-2008
| Werkstück Name ..: MTWZ
-----
STOP
CoLoadModel (NAM=SeiteTrainingP)
SetActiveTool (NAM=NoTool)
DFPRE (NAM=PRE(1), ENB=Y, SNT=PRE)
TCPCADPORT
MEPLA (NAM=PLA(1), CSY=CSY, ITT=GSS)
MECIR (NAM=CIR(1), CSY=CSY, ITT=GSS)
    
```

New/Compatible:  
Graphic & Text based user  
Interface for part programming

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The screenshot displays the Quindos 7 CAD environment. The main window shows a 3D model of a complex mechanical part. A help dialog titled 'MECIR Messe Kreis' is open, providing detailed instructions for measuring a circle. The dialog includes a description, an 'Anweisungsdialog' (instruction dialog) with a diagram and control options, and a list of supported commands.

**MECIR Messe Kreis**

**Beschreibung:**  
Mit der Anweisung MECIR (Messe Circle = Messe Kreis) wird ein Element Kreis gemessen. Der Kreis muß mit mindestens drei Punkten angetastet werden. Die Messpunkte können vor Berechnung des Kreises in eine vom Benutzer frei wählbare Ebene projiziert werden. Als Standard-Anwendung werden die Koordinaten X,Y,Z des Kreismitelpunktes sowie der Radius und der Durchmesser des Kreises ausgewertet.

**Anweisungsdialog:**

**Messe Kreis**

Element: Kreis(1) | Koordinatensystem: CSY(1)

Modus:  
 Messen  
 Berechnen

Projektion in:  
 Element: \_\_\_\_\_

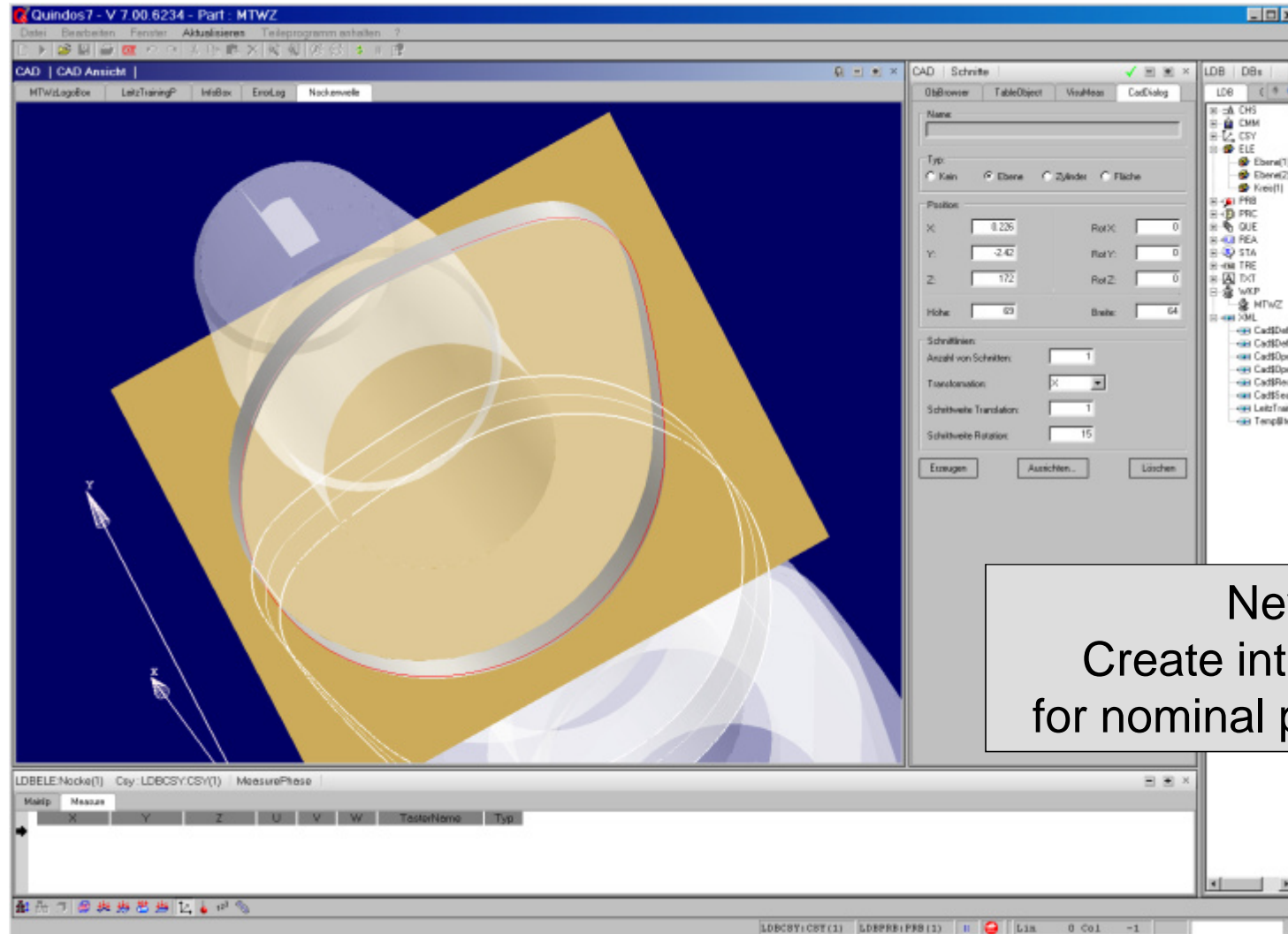
Berechnungart:  
 Befehlsperif (Element)  
 Minimum (Tastbediener)  
 Flachkreis  
 Hülsen

Vorher löschen?  
 Punkte  
 Auswertungen

MECIR (MAN, TYP, CSY, PRO, MOB, COPY, RAD, COI, INO, QUE, SIG, NOM, ITY, NT, ITR, PTY, CTY, DS, MS6, ADT, DEL, NWA, UMD)

New:  
MS compliant Help Functions (F1)

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New:  
Create intersection  
for nominal point pattern

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Antastpunkt

Punktart: Antastpunkt (FRB)

Tester/Sensor (Tool): FFB(1)

Quelle/Element:

Koordinaten:

X: 143

Y: -20.57917

Z: -79.45318

R: 0

Richtung:

U: 0

V: 0.995614401

W: 0.00144909

Maßp	Maßwert	X	Y	Z	U	V	W	TesterName	Typ
143.0000	-20.5792	-79.4532	0.00	0.99	-0.01	FRB (1)	FRB		
143.0000	-20.1781	-79.1715	0.00	0.99	-0.00	FRB (1)	FRB		
143.0000	-19.7906	-78.8716	0.00	0.63	-0.78	FRB (1)	FRB		
143.0000	-19.4176	-78.5538	0.00	0.47	-0.75	FRB (1)	FRB		
143.0000	-19.0601	-78.2186	0.00	0.70	-0.71	FRB (1)	FRB		

New:  
Create nominal points  
on intersections



PowerTrain Solutions

The screenshot displays the Quindos 7 CAD environment. The central 3D view shows a transparent screw model. The 'Messe Kontur' dialog box is active, showing a 2D contour of the screw's thread with red measurement points. The 'Main Command Buffer' at the bottom contains the following text:

```

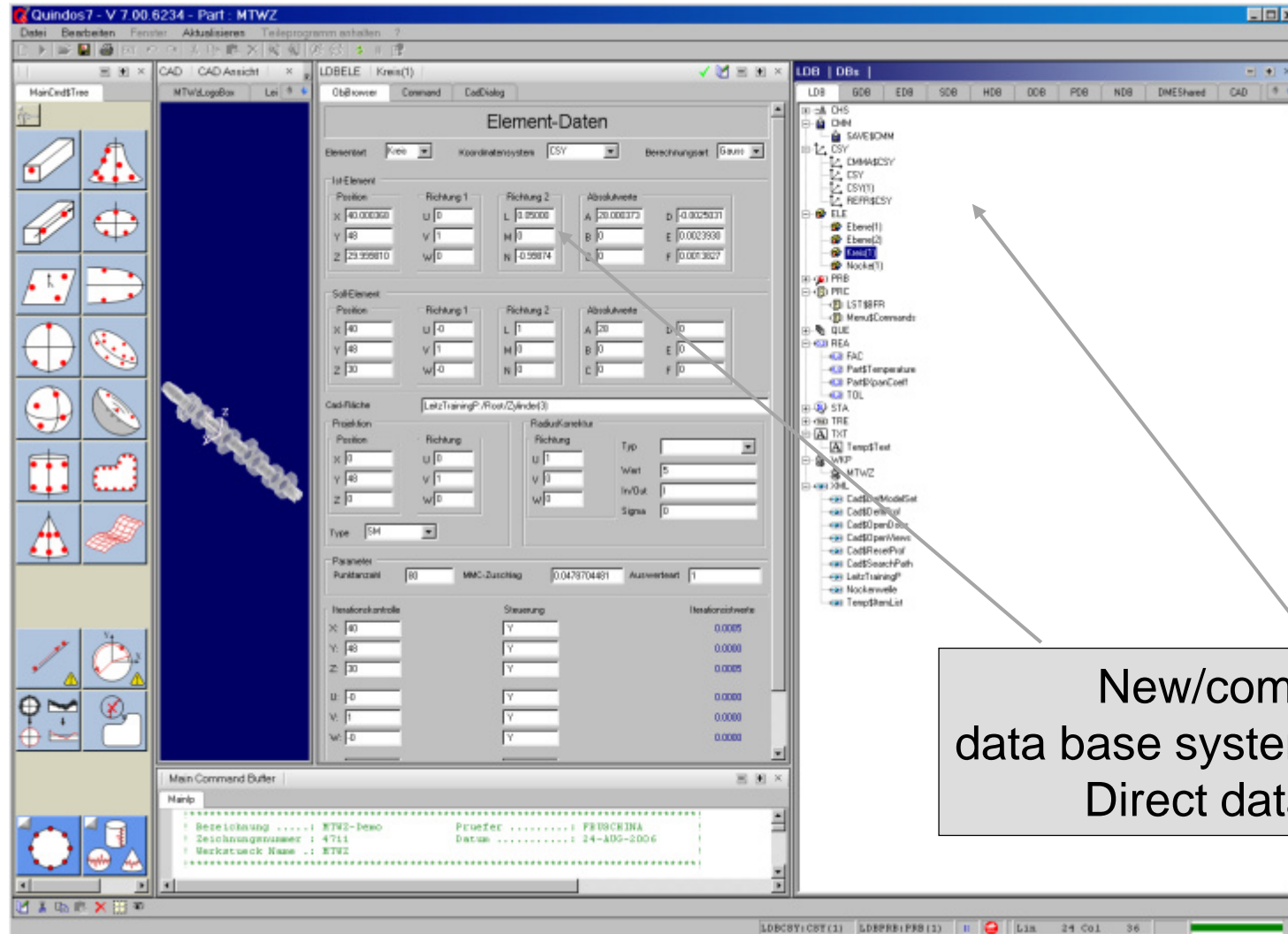
Mainp
.....
! Bezeichnung .....: HTWZ-Demo           Frueher .....: FBUSCHIMA
! Zeichnungsnummer : 0711                 Datum .....: 24-07G-2006
! Werkstück Name  : HTWZ
.....
STOP
!----Lade CAD Modell
CadLoadModel (NAM=LetzteTrainingP)
! CadLoadModel (NAM=Nockenwelle)
SetActiveTool (NAM=NoTool)
DFNPRB (NAM=PRB(1), END=Y, SNT=PER)

!---- Start Messprogramm
START (VKF=HTWZ, TOP=N, TEI=Y)

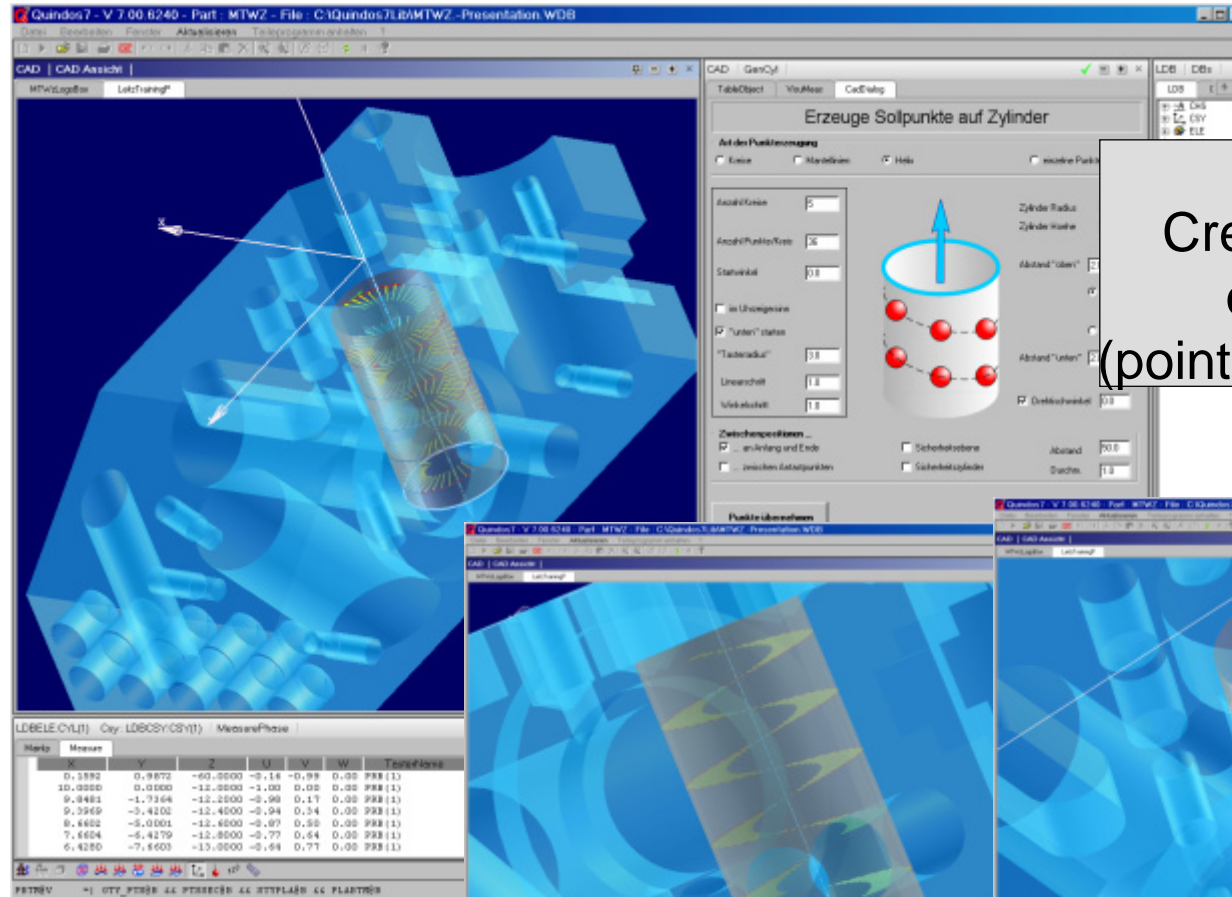
!---- Ausrichtung
MEPGA (NAM=Ebene(1), CST=CST, ITT=088)
MECIB (NAM=Kreis(1), CST=CST, ITT=088)
ROUNDMER (ELE=Kreis(1), FAC=250, PL=WINDOW, OFF=Y, PR0=ZZ, TOL=0.01, OPN=N)
MEPGA (NAM=Ebene(2), CST=CST, ITT=088)
BLDCSV (NAM=CST(1), TYP=CAP, SPA=Ebene(1), SDR=+Z, PLA=Ebene(2), PDR=-X, ZIE=Kreis(1), YIE=Kreis(1), ZIE=Ebene(1), CIB=Y)
MEZDE (NAM=Nocke(1), CST=CST(1), BOB=INOC,MOE), IND=0)
    
```

New/compatible:  
command buffer/  
Microsoft short cut keys

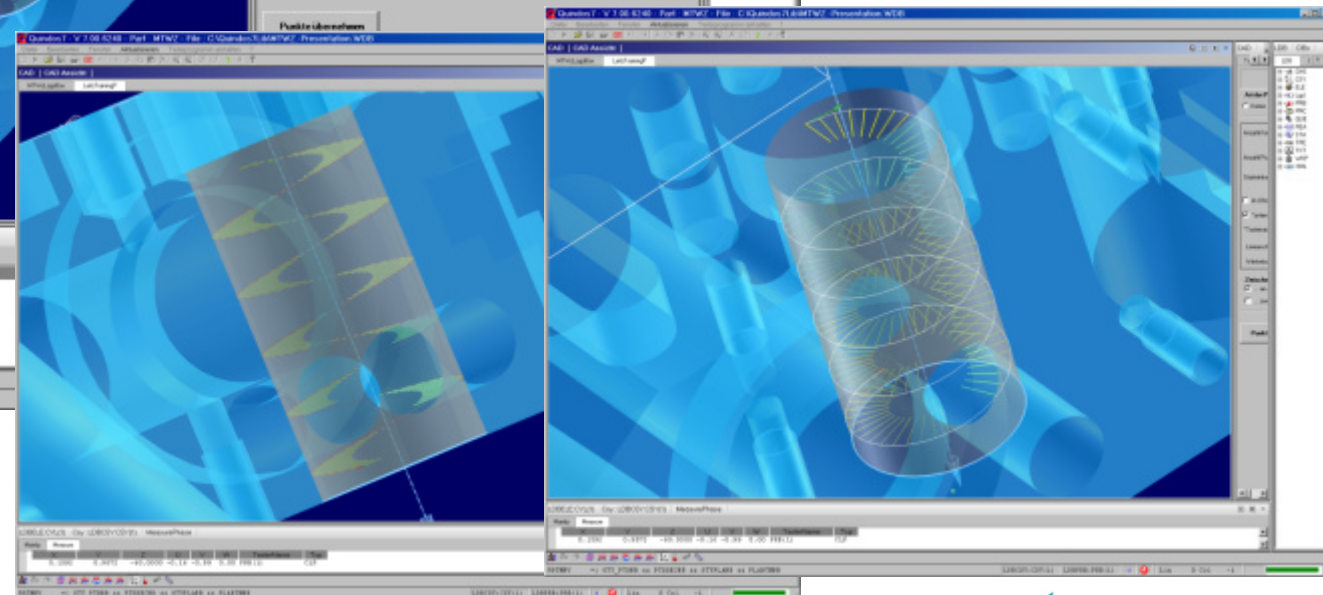
PowerTrain Solutions



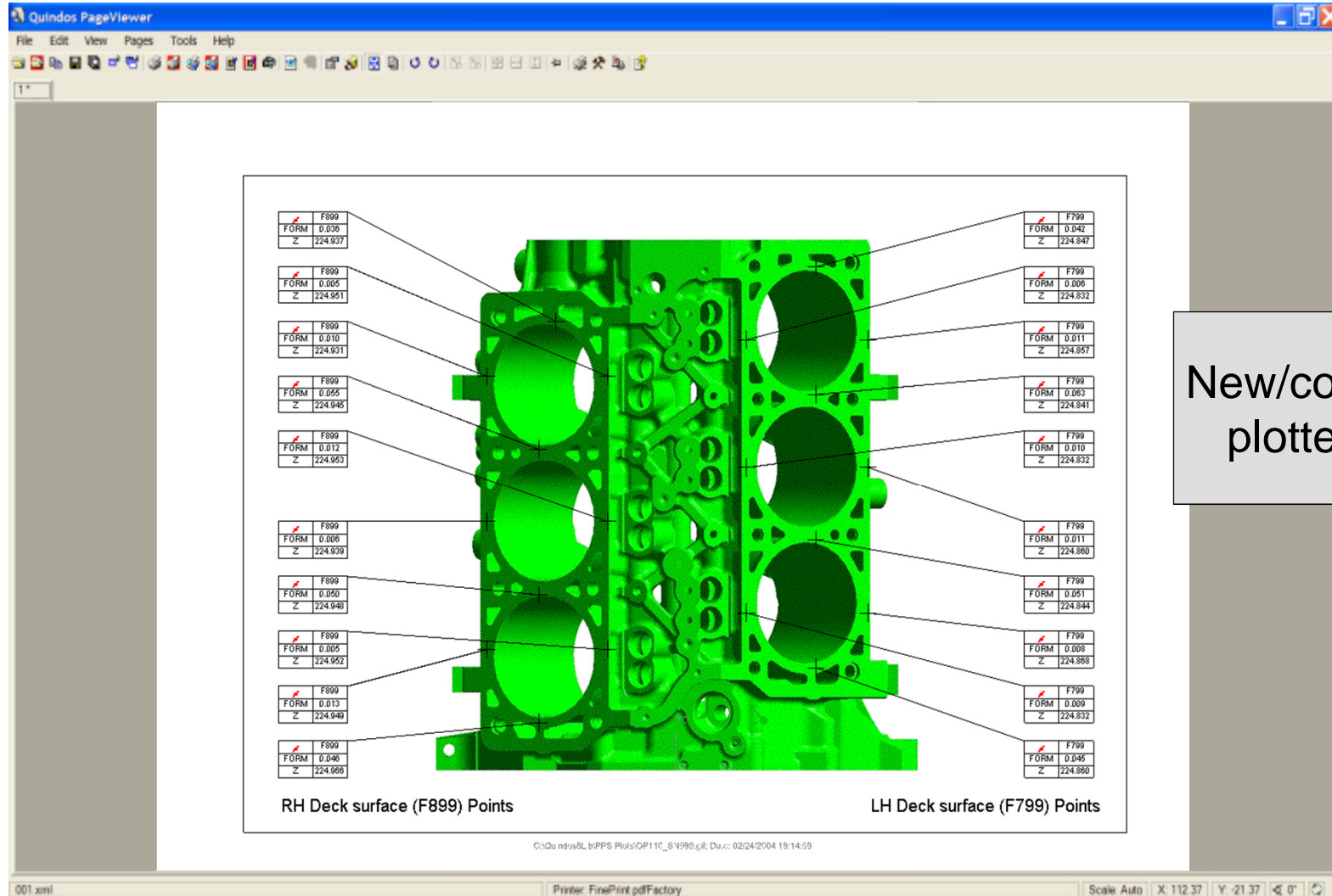
PowerTrain Solutions



New:  
Create nominal points  
on basic features  
(points on helix for Cylinder)

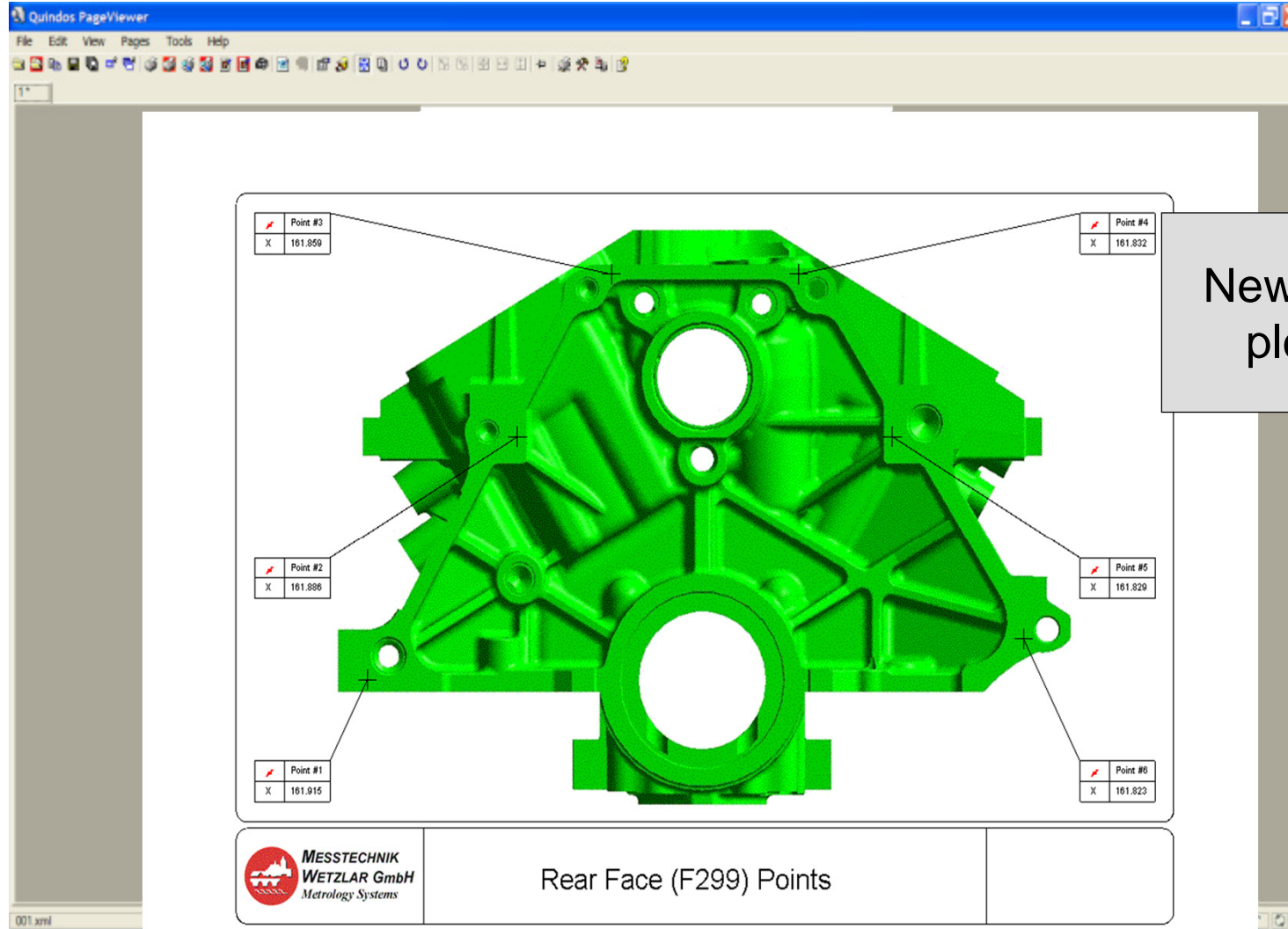


## PowerTrain Solutions



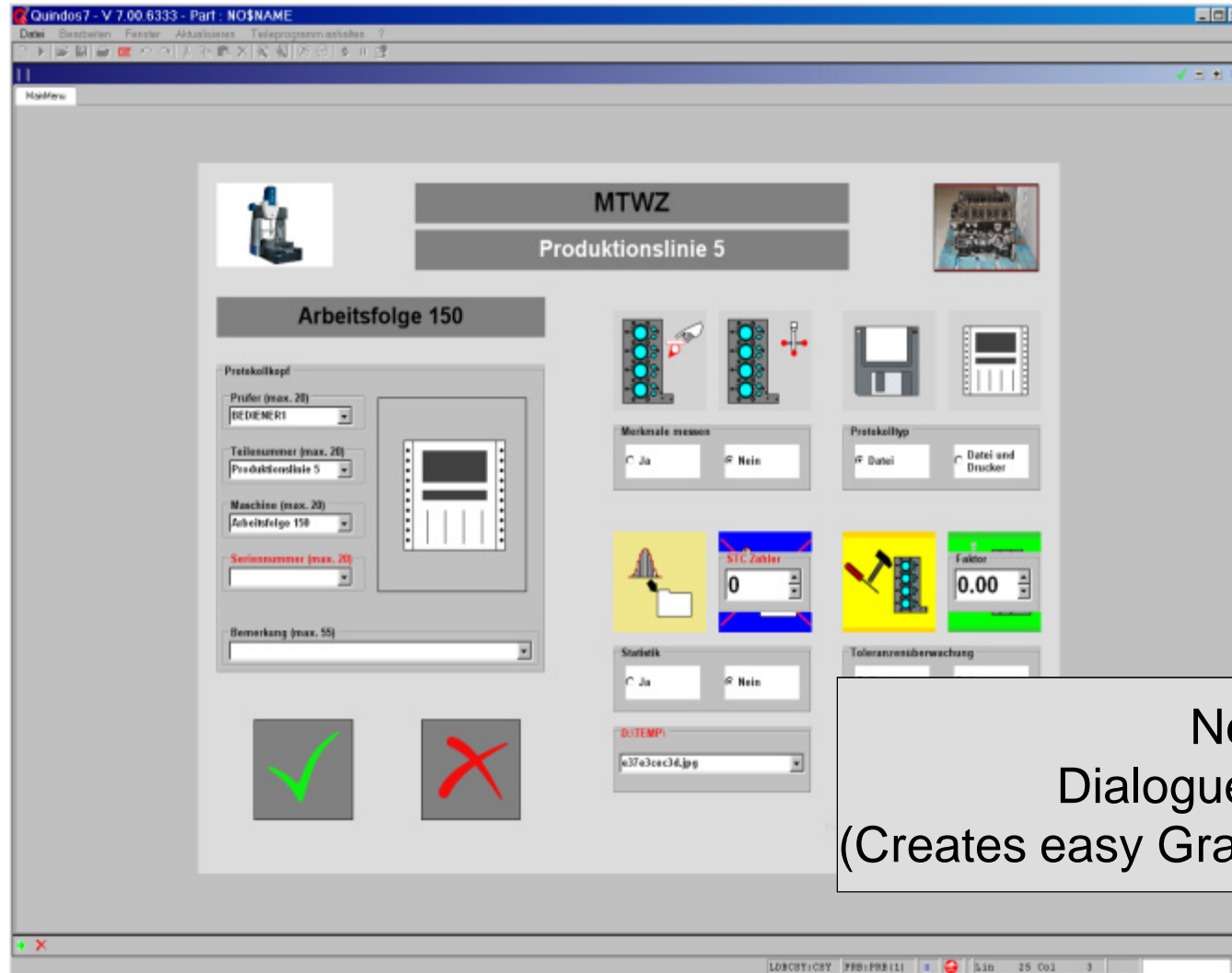
New/compatible:  
plotter server

PowerTrain Solutions



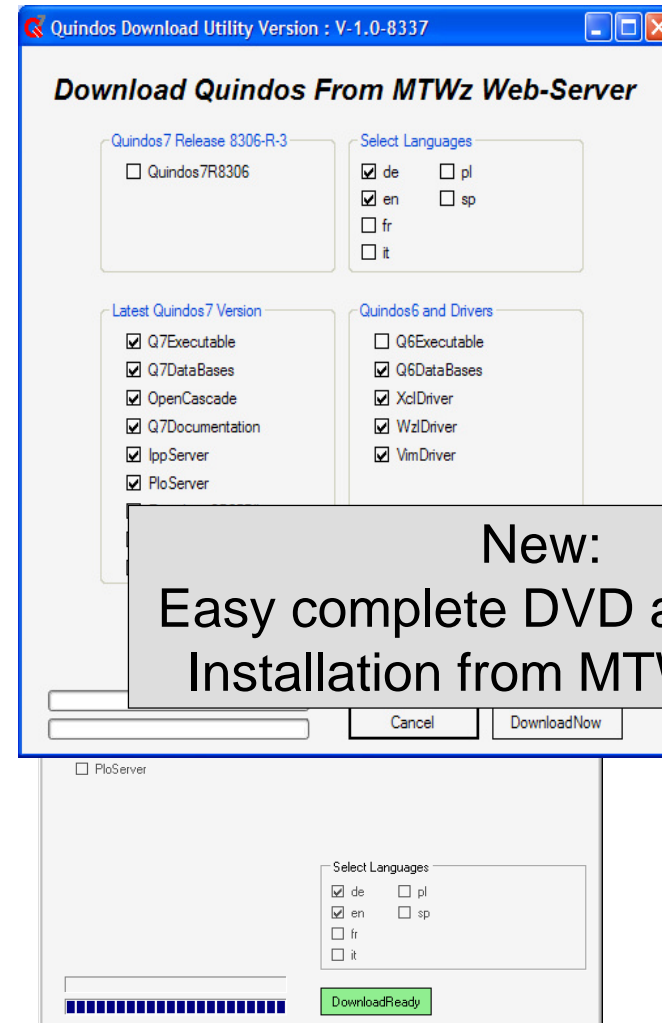
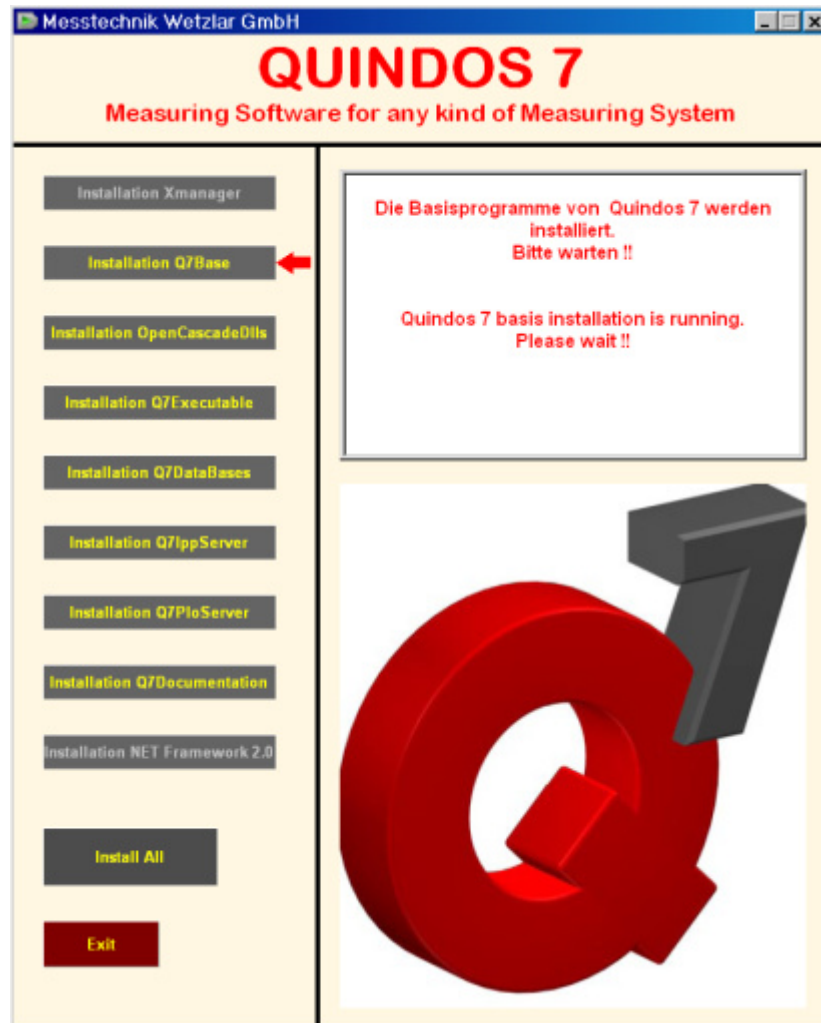
New/compatible:  
plotter server

PowerTrain Solutions



New:  
DialogueDesigner  
(Creates easy Graphic User Interface)

PowerTrain Solutions



PowerTrain Solutions

Physikalisch-Technische Bundesanstalt  
Braunschweig und Berlin



Prüfbericht  
Test Report

**Gegenstand:** Auswertesoftware für Koordinatenmessgeräte  
*Object:* Evaluation software for coordinate measuring machines

**Hersteller:** Messtechnik Wetzlar GmbH  
*Manufacturer:* Walter Zapp Strasse 4  
35578 Wetzlar  
GERMANY

**Typ:** QUNDOS Version 7  
*Type:*

**Gerätenummer:**  
*Serial number:*

**Auftraggeber:** Messtechnik Wetzlar GmbH  
*Applicant:* Walter Zapp Strasse 4  
35578 Wetzlar  
GERMANY

**Anzahl der Seiten:** 4  
*Number of pages:*

**Geschäftszeichen:** PTB-5.3-2006-084  
*Reference No.:*

**Prüfzeichen:** PTB-5.3-2006-084  
*Test mark:*

**Datum der Prüfung:** 2006-11-17  
*Date of test:*

**Im Auftrag:** Braunschweig, 2006-11-20  
*By order:*

*D. Schwlenke*  
Dr.-Ing. H. Schwlenke

**Siegel:**  
*Seal:*



**Bearbeiter:**  
*Examiner:*

*N. Gerwien*  
Dipl.-Ing. N. Gerwien

Physikalisch-Technische Bundesanstalt



Seite 4 zum Prüfbericht vom 2006-11-20, Prüfzeichen: PTB-5.3-2006-084  
Page 4 of test report of 2006-11-20, test mark: PTB-5.3-2006-084

Die Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig und Berlin ist das natur- und ingenieurwissenschaftliche Staatsinstitut und die technische Oberbehörde der Bundesrepublik Deutschland für das Messwesen und Teile der Sicherheitstechnik. Die PTB gehört zum Dienstbereich des Bundesministeriums für Wirtschaft und Technologie. Sie erfüllt die Anforderungen an Kalibrier- und Prüflaboratorien auf der Grundlage der DIN EN ISO/IEC 17025.

Zentrale Aufgabe der PTB ist es, die gesetzlichen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI) darzustellen, zu bewahren und – insbesondere im Rahmen des gesetzlichen und industriellen Messwesens – weiterzugeben. Die PTB steht damit an oberster Stelle der metrologischen Hierarchie in Deutschland. Kalibrierscheine der PTB dokumentieren die Rückführung des Kalibriergegenstandes auf nationale Normale.

Dieses Zertifikat ist in Übereinstimmung mit den Kalibrier- und Messmöglichkeiten (CMCs), wie sie im Anhang C des gegenseitigen Abkommens (MRA) des Internationalen Komitees für Maße und Gewichte enthalten sind. Im Rahmen des MRA wird die Gültigkeit der Kalibrier- und Prüfscheine von allen teilnehmenden Instituten für die im Anhang C spezifizierten Messgrößen, Messbereiche und Messunsicherheiten gegenseitig anerkannt (nähere Informationen unter <http://www.bipm.org>).

*The Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig and Berlin is the national institute for science and technology and the highest technical authority of the Federal Republic of Germany for the field of metrology and certain sectors of safety engineering. The PTB comes under the auspices of the Federal Ministry of Economics and Technology. It meets the requirements for calibration and testing laboratories as defined in the EN ISO/IEC 17025.*

*It is fundamental task of the PTB to realize and maintain the legal units in compliance with the International System of Units (SI) and to disseminate them, above all within the framework of legal and industrial metrology. The PTB thus is on top of the metrological hierarchy in Germany. Calibration certificates issued by it document that the object calibrated is traceable to national standards.*

New/compatible:  
Only software where the certification is valid since Version 1.1 by German PTB

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**Physikalisch-Technische Bundesanstalt**  
Braunschweig und Berlin

**PTB**

**Bericht**  
Report

**Gegenstand:** Testdaten für evolventische Zylinderradauswertungen  
*Object: Testdata for cylindrical involute gear algorithms*

**Hersteller:** Leitz Messtechnik GmbH  
Siegfried-Hiepe-Str. 2-12  
35578 Wetzlar  
*Manufacturer*

**Typ:** QUINDOS 4304  
*Type*

**Gerätenummer:** ---  
*Serial number*

**Antragsteller:** Leitz Messtechnik GmbH  
Siegfried-Hiepe-Str. 2-12  
35578 Wetzlar  
*Applicant*

**Anzahl der Seiten des Berichtes:** 4  
*Number of pages of the report*

**Geschäftszeichen:** PTB-5.33-04.046  
*Reference No.*

**Prüfzeichen:** ---  
*Test mark*

**Datum der Prüfung:** 2004-09-02  
*Date of test*

**Im Auftrag:** Braunschweig, 2004-09-24  
*By order*

**Bearbeiter:** ---  
*Examiner*

*F. Ködel*  
Dr.-Ing. Franz Wöldele  
Direktor und Professor

**Siegel**  
See

*Frank Härtig*  
Dr.-Ing. Frank Härtig

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**Physikalisch-Technische Bundesanstalt**  
Seite 3 zum Bericht vom, 2004-09-24 Geschäftszeichen: PTB-5.33-04.046  
*Page 3 of report of 4 Reference No.:*

**PTB**

**Scope**  
A software test is carried out by which gear evaluations for cylindrical involute gears are checked. The basis of this test is formed by reference datasets and reference algorithms of the PTB.

**Conditions**  
The test comprises the gear measurands for:

- Profile:** total profile deviation, profile slope deviation, profile form deviation, profile crowning; form deviation in the root relief section, length of root relief, amount of root relief, form deviation in the section of tip relief, length of tip relief, amount of tip relief
- Helix:** total helix deviation, helix slope deviation, helix form deviation, crowning of flank line, form deviation in the end relief section of the reference side, length of end relief on reference side, amount of end relief in the section of reference side, form deviation in end relief section of non-reference side, length of end relief on non-reference side, amount of end relief in the section of the non-reference side
- Pitch:** adjacent pitch error, total pitch error
- Runout:** Dimension over spheres

The gear reference algorithms of the PTB are based upon the specifications of the relevant standards and guidelines [1, 2, 3, 4]

**Procedure**  
The applicant received the reference data sets pro001g, pro002g, hel001, hel002, hel003, pitch003, pitch004, pitch006, pitch006 and accessory documents generated by PTB

According to the explanation of the applicant the reference data sets have been evaluated using the software specified in the report. For the evaluation the reference data have been used in the same way as measurement data is used on a gear measurement device. The parameter determined by the applicant have been compared to the reference values.

**Results**  
For all measurement parameters, a maximum permissible error of  $\pm 0,1 \mu\text{m}$  with regard to the reference values of PTB is permitted. The measurement results submitted lie within the tolerated range. The software test for gear evaluations for involute cylindrical gears is considered to have been passed.

**References**

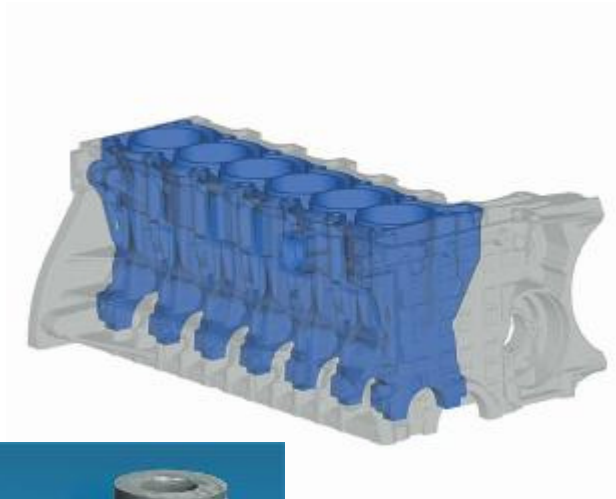
QUINDOS Option for cylindrical Gears is PTB certified

## New Quindos Options

- Abrasive wear measurement at automotive parts
- Unknown Camshaft (reverse engineering)
- Curvic coupling
- Ultimate Blade
- Impeller

## Abrasive wear measurement

- Camshaft
- Crankcase
- Bearing
- Piston ring
- Piston



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- Crankcase (block)

**Motor-Verschleiß-Messung**

EXIT

Motor-Typ: 4711 | Test-Typ: 0015 | Teilesatz-Nr.: 123

Versuchs-Nr.: 1748 | Motor-Nr.: AB-4711 | km / Std.: 0 | Prüfer: Quindos

Zylinderblock | gesamte Palette | Kollbenringe

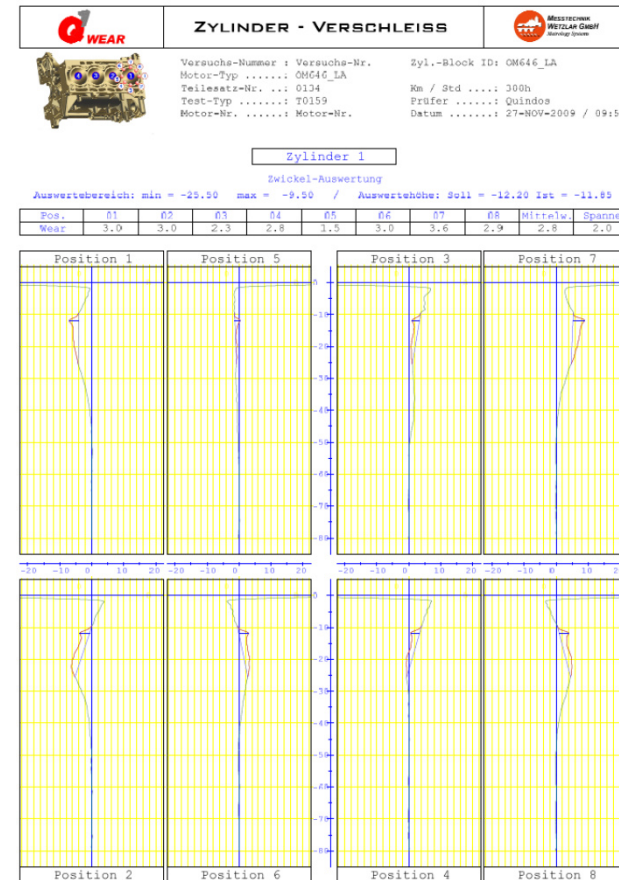
Nockenwelle | Kolben

Lagerschalen | Steuerkette

Taster einmessen | Einstellungen | Maschine und Umgebung

Versuchs-Nr.: 1748.0000  
Motor-Typ: 4711.0000  
Teilesatz-Nr.: 123  
Test-Typ: 815.0000  
km / Std.: 0.0000  
Prüfer: Quindos  
Datum: 27-NOV-2009

MESSTECHNIK WITZLAR GMBH  
Metrology Systems  
ISP - V 7.01.9331-B



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- Camshaft

**Verschleißmessung Nockenwelle**

Nr.	Nockenwellen ID	Anzahl Nocken
1	Einlass	8
2	Auslass	8

**WEAR** NOCKENWELLEN - VERSCHLEISS

Versuchs-Nr.: 1748.0000  
Motor-Typ: 4711.0000  
Teilesatz-Nr.: 123  
Test-Typ: 815.0000  
km / Std.: 0.0000  
Prüfer: Quindos  
Datum: 27-NOV-2009

Nocken-Nummer	01	02	03	04	05	06	07	08	Mittel	Spanne
max. Verschl. [µm]	0,2	0,5	0,1	0,2	0,2	0,3	0,3	0,1	0,2	0,4
zur No.-spitze [°]	-4,0	23,0	19,0	19,5	27,1	24,0	18,0	28,0	19,0	19,0
Versch. an Spitze [µm]	0,0	0,0	-0,2	-0,1	0,0	0,0	0,2	-0,1	0,0	0,3

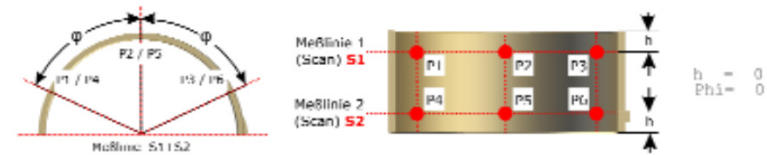
Fehlerüberhöhung: 500  
Auswertebereich [°]: -22,5 / 39,0  
: Nockenspitze : max. Verschleiß : Auswertebereich

MESSTECHNIK WITZLAR GmbH  
Herzberg-Systeme  
ISP - V 7.01.933



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• Bearing



### Verschleißmessung Lagerschalen

Mess-Nr. vor Test: 1 2 1+2  
Messung nach Test: [ ]

**zu messende Lagerschalen**

Nr.	Hauptlager	Nockenlage	Pleuelager
1	[✓]	[✓]	[✓]
2	[✓]	[✓]	[✓]
3	[✓]	[✓]	[✓]
4	[✓]	[✓]	[✓]
5	[✓]	[✓]	[✓]
6	[✗]	[✗]	[✗]
7	[✗]	[✗]	[✗]

Messhöhe: 3 5 3  
Winkel: 60 65 70  
Scangeschw. [mm/d]: 5.0

drucke? [ ]  
 Ausgabe in PDF-Datei?  
 Ausgabe in Excel-Datei?

**Vorrichtung - KSY**  
 einmessen [✓] löschen [✗]  
**Temperaturkompensation**  
 ein [✓] aus [✗]  
 akt. Temperatur aus KMG lesen  
 manuell X-Temp [ ]  
 automatisch Y-Temp [ ]  
 halbautom. Z-Temp [ ]  
 W-Temp [ ]  
 Ausd.-Koeff. 0.0001150

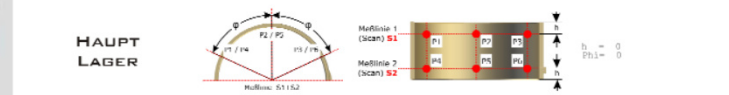
Messung starten [ ]  
 Auswertung starten [ ]

Versuchs-Nr. 1749.0000  
 Motor-Typ 4711.0000  
 Teilesatz-Nr. 123  
 Test-Typ 815.0000  
 km / Std. 0.0000  
 Prüfer Quindos  
 Datum 27-NOV-2009

MESSTECHNIK WETZLAR GMBH  
 Metrology Systems  
 ISP - V.7.01.9331-4

**WEAR** **GLEITLAGER - VERSCHLEISS** **MESSTECHNIK WETZLAR GMBH**

Versuchs-Nummer: Versuchs-Nr. Messung 1 ...: Vormessung 1  
 Motor-Typ ...: OM646\_LA Messung 2 ...: Vormessung 2  
 Teilesatz-Nr. ...: 0150 Km / Std. ...: 300h  
 Test-Typ ...: T0159 Prüfer ...: Quindos  
 Motor-Nr. ...: Motor-Nr. Datum ...: 27-NOV-2009 / 09:53



Deckel				Gehäuse						
Lag-Nr.	Scan	Pkt.-Nr.	Soll [µm]	Diff. [µm]	Graph	Scan	Pkt.-Nr.	Soll [µm]	Diff. [µm]	Graph
1	S1	1	2.2577	0.3	[Graph]	S1	1	2.2607	0.1	[Graph]
		2	2.2577	0.3	[Graph]		2	2.2607	0.1	[Graph]
		3	2.2577	0.3	[Graph]		3	2.2607	0.1	[Graph]
	S2	4	2.2583	0.2	[Graph]	S2	4	2.2609	-0.2	[Graph]
		5	2.2583	0.2	[Graph]		5	2.2609	-0.2	[Graph]
		6	2.2583	0.2	[Graph]		6	2.2609	-0.2	[Graph]
2	S1	1	2.2612	0.0	[Graph]	S1	1	2.2606	0.0	[Graph]
		2	2.2612	0.0	[Graph]		2	2.2606	0.0	[Graph]
		3	2.2612	0.0	[Graph]		3	2.2606	0.0	[Graph]
	S2	4	2.2619	0.1	[Graph]	S2	4	2.2603	-0.1	[Graph]
		5	2.2619	0.1	[Graph]		5	2.2603	-0.1	[Graph]
		6	2.2619	0.1	[Graph]		6	2.2603	-0.1	[Graph]
3	S1	1	2.2622	-0.3	[Graph]	S1	1	2.2662	0.1	[Graph]
		2	2.2622	-0.3	[Graph]		2	2.2662	0.1	[Graph]
		3	2.2622	-0.3	[Graph]		3	2.2662	0.1	[Graph]
	S2	4	2.2618	-0.5	[Graph]	S2	4	2.2670	0.2	[Graph]
		5	2.2618	-0.5	[Graph]		5	2.2670	0.2	[Graph]
		6	2.2618	-0.5	[Graph]		6	2.2670	0.2	[Graph]
4	S1	1	2.2618	0.2	[Graph]	S1	1	2.2606	-0.2	[Graph]
		2	2.2618	0.2	[Graph]		2	2.2606	-0.2	[Graph]
		3	2.2618	0.2	[Graph]		3	2.2606	-0.2	[Graph]
	S2	4	2.2624	0.1	[Graph]	S2	4	2.2607	0.3	[Graph]
		5	2.2624	0.1	[Graph]		5	2.2607	0.3	[Graph]
		6	2.2624	0.1	[Graph]		6	2.2607	0.3	[Graph]
5	S1	1	2.2659	-0.1	[Graph]	S1	1	2.2608	-0.6	[Graph]
		2	2.2659	-0.1	[Graph]		2	2.2608	-0.6	[Graph]
		3	2.2659	-0.1	[Graph]		3	2.2608	-0.6	[Graph]
	S2	4	2.2655	0.0	[Graph]	S2	4	2.2608	-0.3	[Graph]
		5	2.2655	0.0	[Graph]		5	2.2608	-0.3	[Graph]
		6	2.2655	0.0	[Graph]		6	2.2608	-0.3	[Graph]

- unknown Camshaft – CAMSHAFT

XY

### Messung der unbekannter Nockenwelle

EXIT

Kennung der Welle: **Unknown**    Anzahl Nocken: **12**

KSY einmessen: **manuell** | **automat.** | nein

Nut     Indexbohrung  
 Ölbohrung     Ebene  
 Zentrierung

Sicherheits-Punkte

+X	+Y	-X	-Y
70.0	70.0	-50.0	-70.0

Parameter

Geschw. [mm/s]	Punktdichte [mm]
5.0	7.0

Nr.	mes?	E	A	P	Z-Pos.
1	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-139.0
2	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-117.0
3	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-96.0
4	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-51.0
5	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-29.0
6	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	-7.0
7	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	41.0
8	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	62.0
9	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	83.5
10	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	129.0
11	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	150.0
12	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	172.0

Messung starten

?



## Curvic Couplings

Toothed gears used for accurate mating & centering of rotating parts.

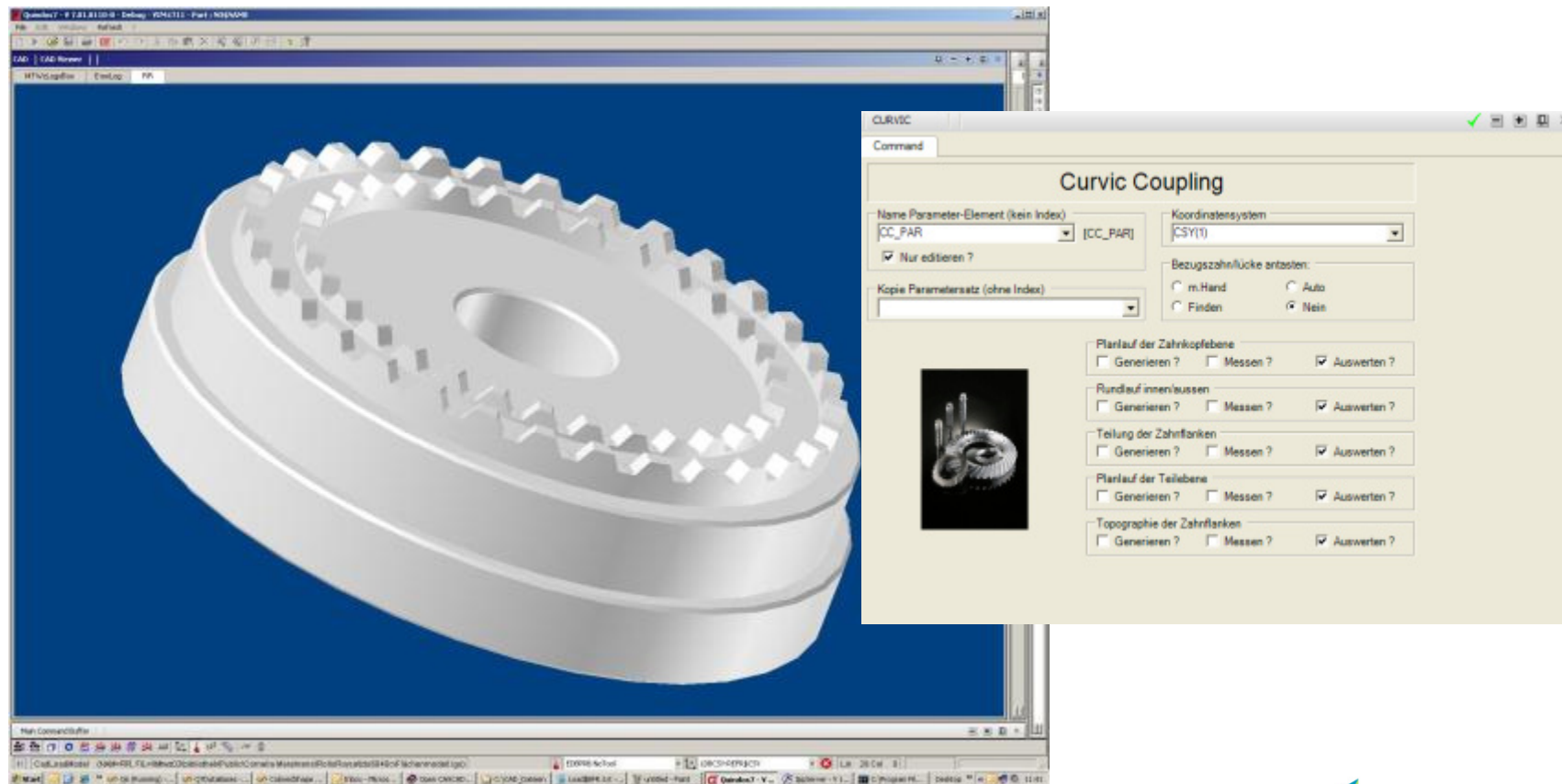


### Applications:

- Turbine rotors
- Crankshafts

PowerTrain Solutions

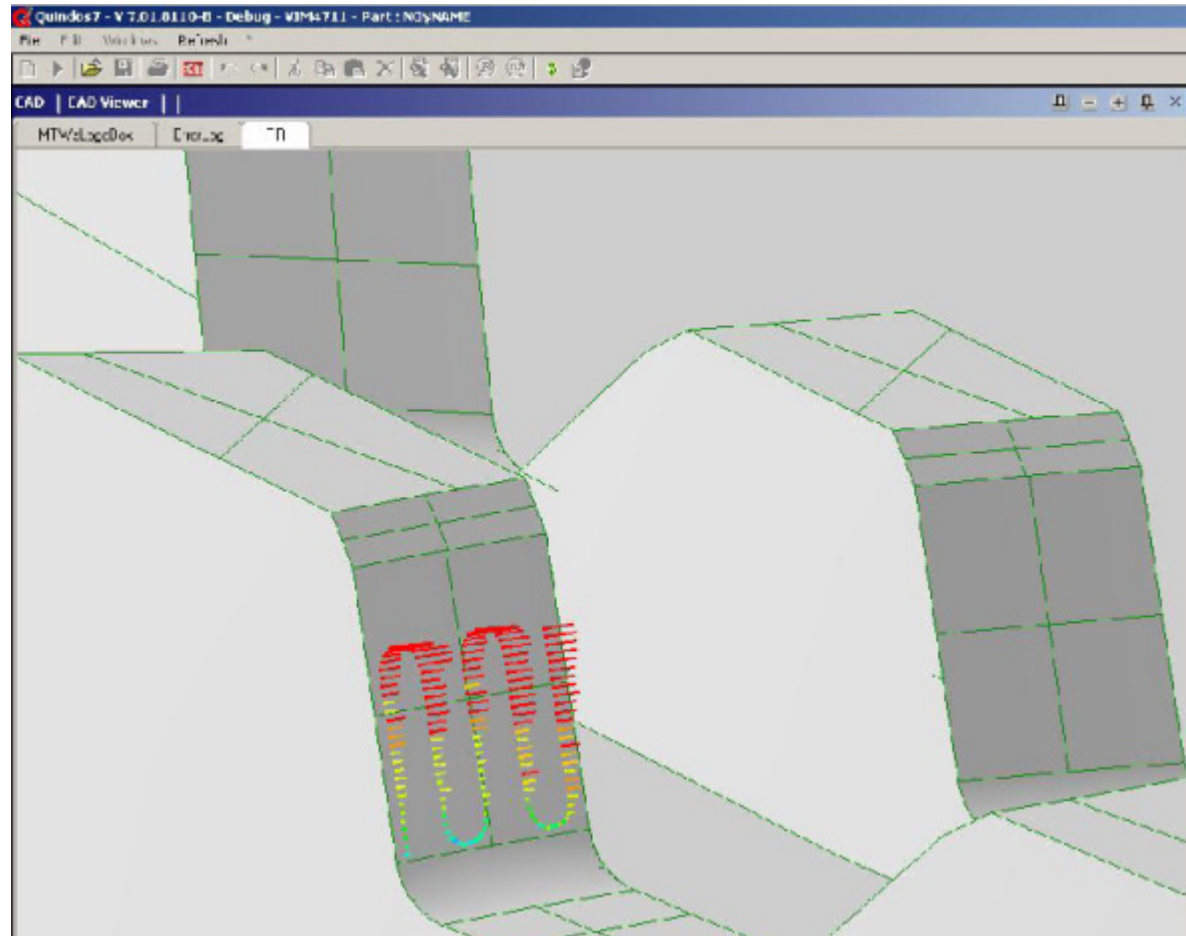
Curvic coupling master model generated in QUINDOS using the curvic coupling data





## Topography measurement & contact representation

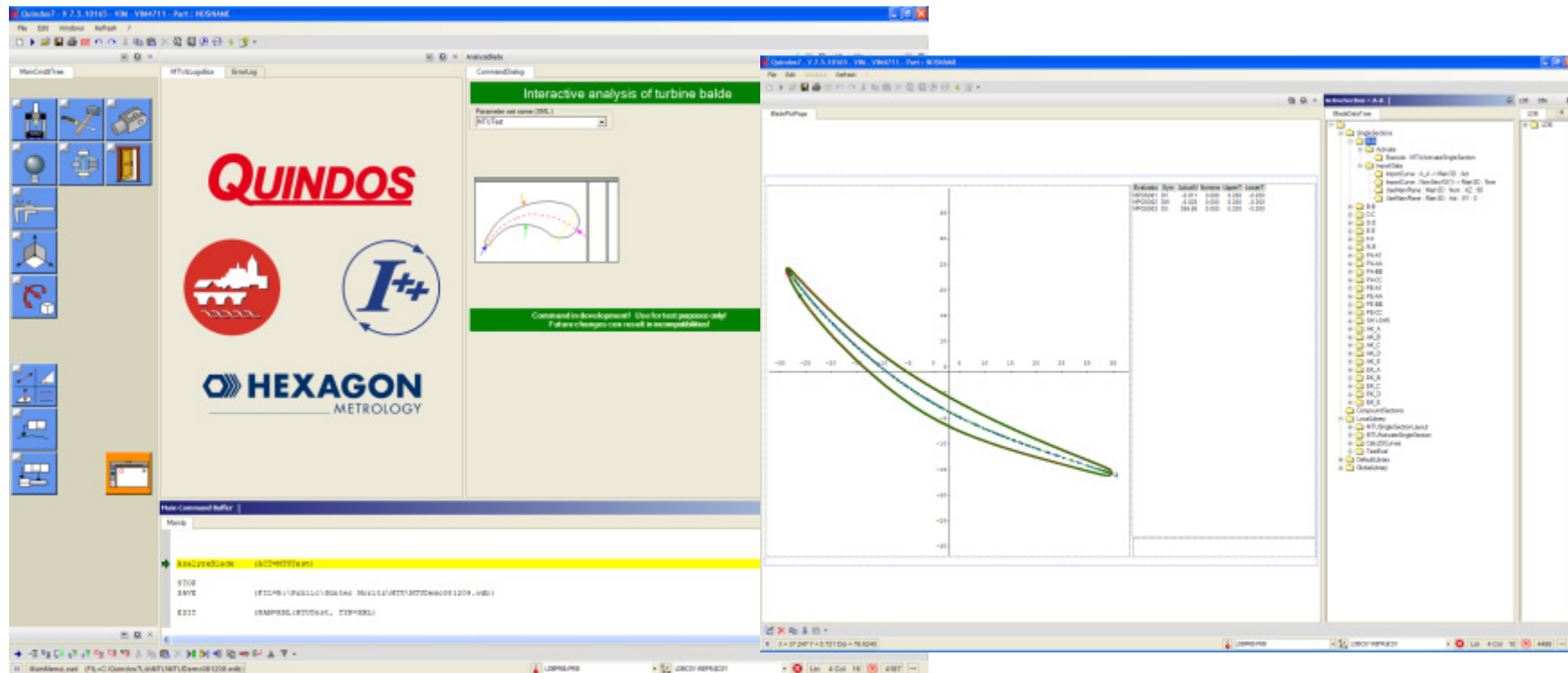
Sweep scanning of the topography is used to determine the contact pattern of the CC to be checked. All of the flanks are measured in order to determine a true representation of the pairing quality of the curvic coupling with a master coupling. The result of the pairing is the eccentricity, axial runout & radial runout & pairing quality.



## PowerTrain Solutions

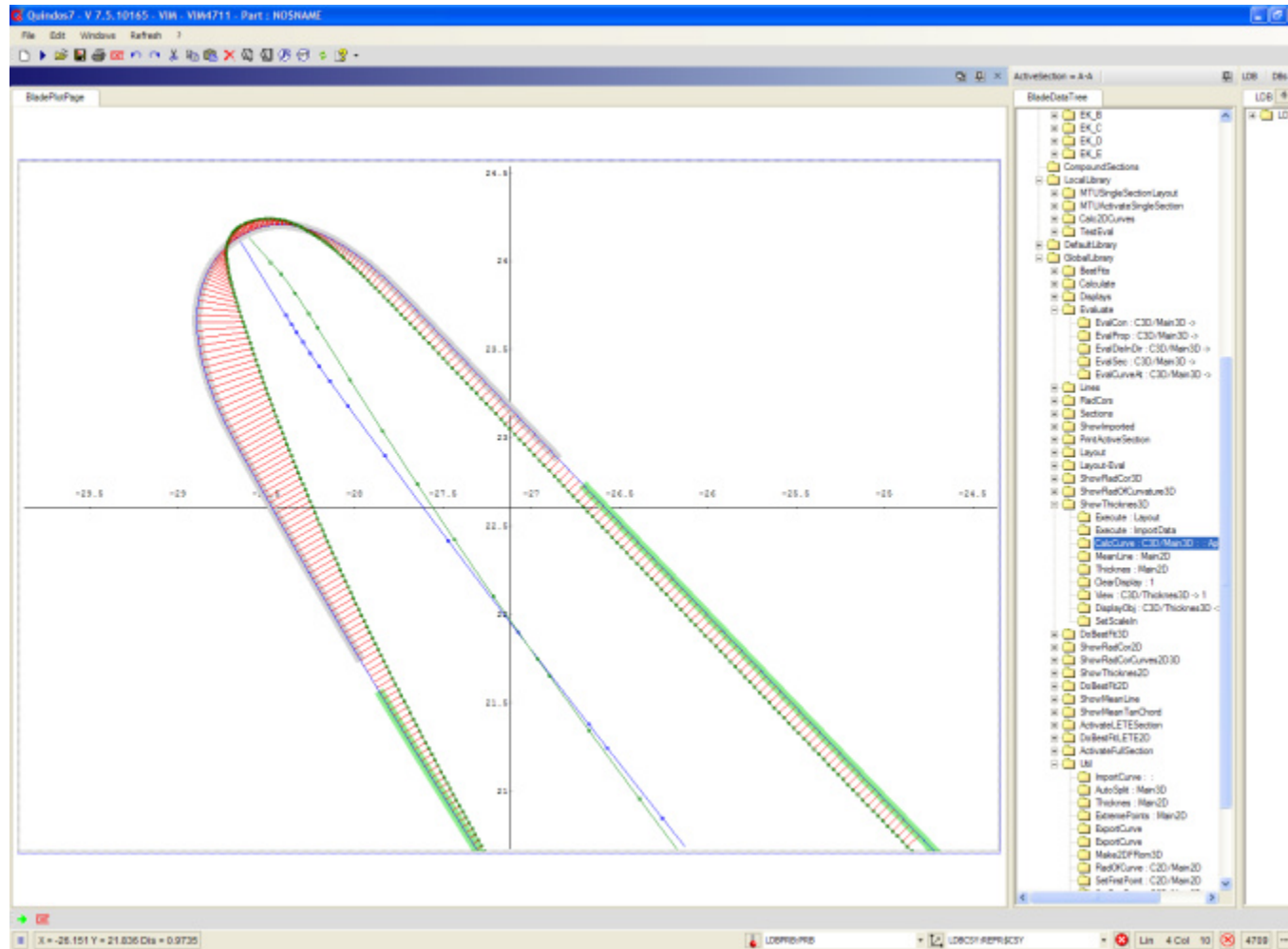
# Ultimate Blade

- 2D Visualization and interactive evaluation tool for turbine profiles;
- Parameters can be defined interactive and saved for the CNC mode



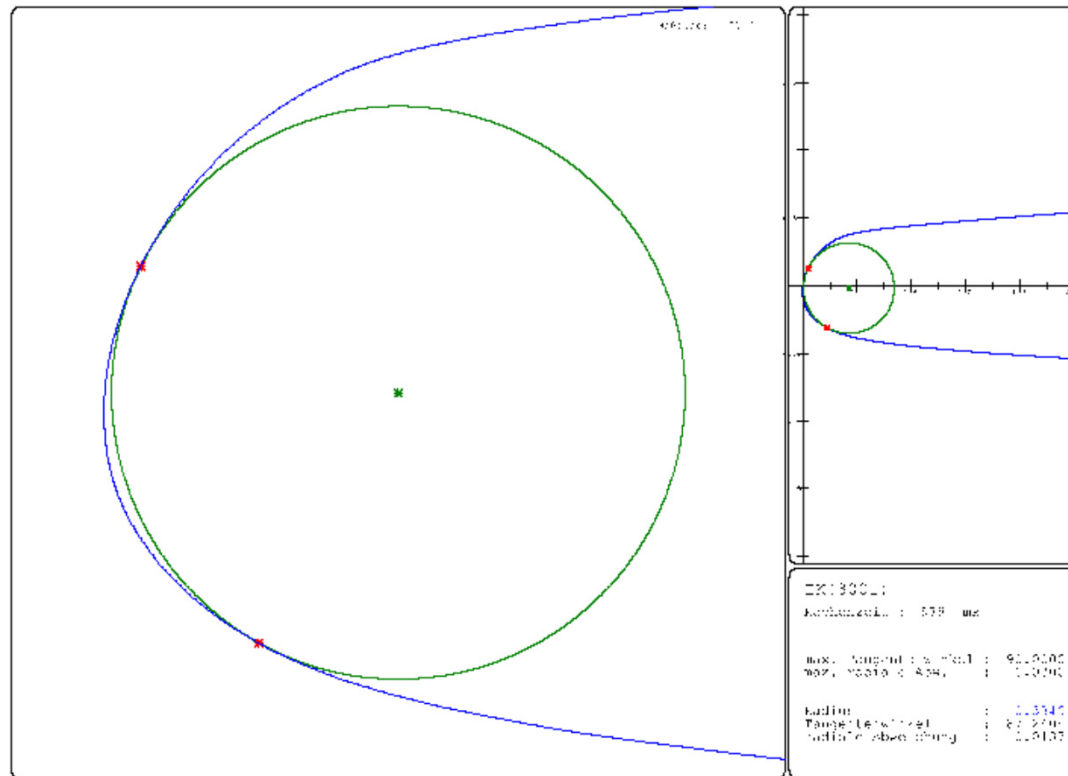


# Ultimate Blade



## Ultimate Blade

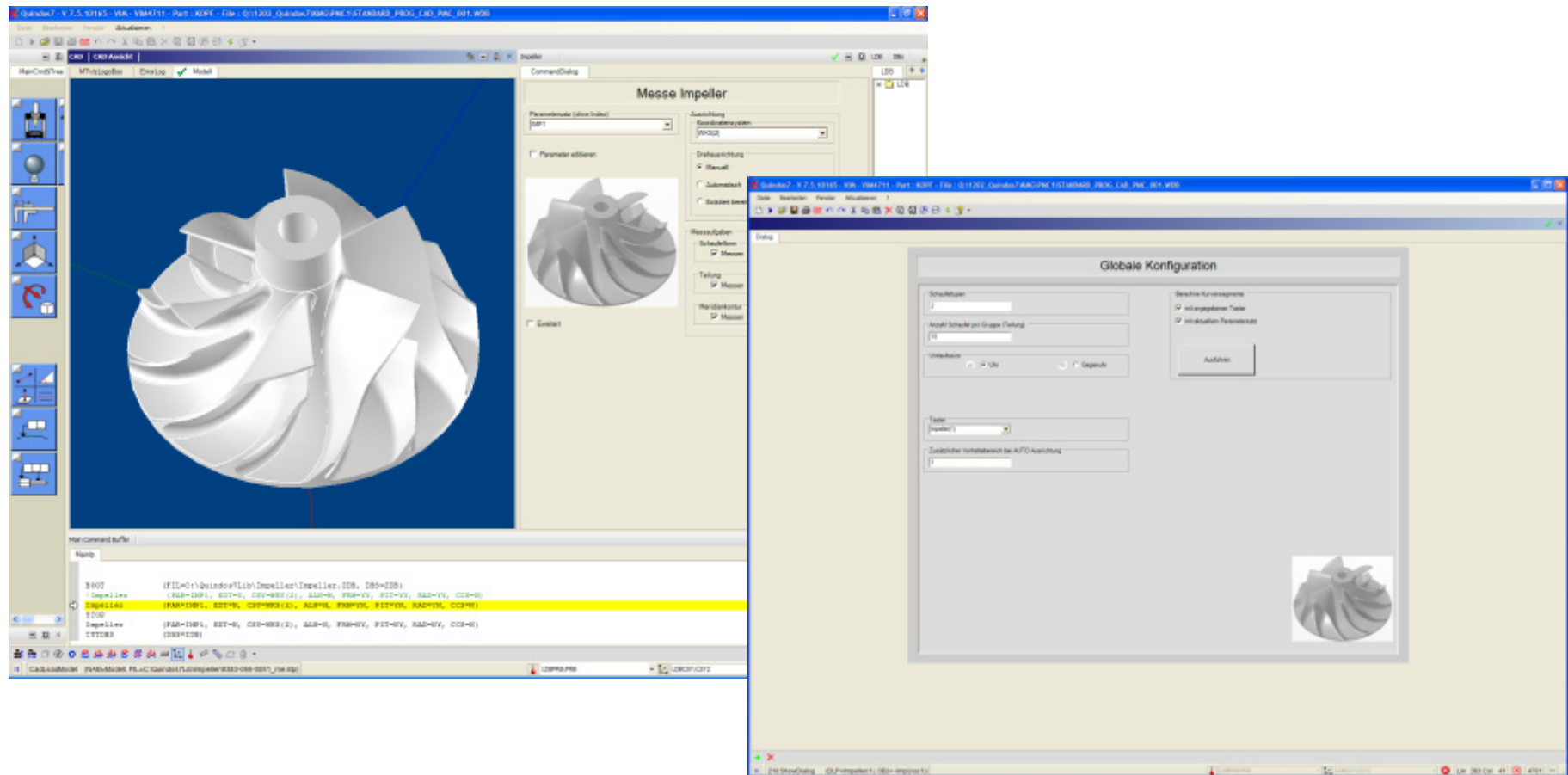
Automatic edge radius recognition.



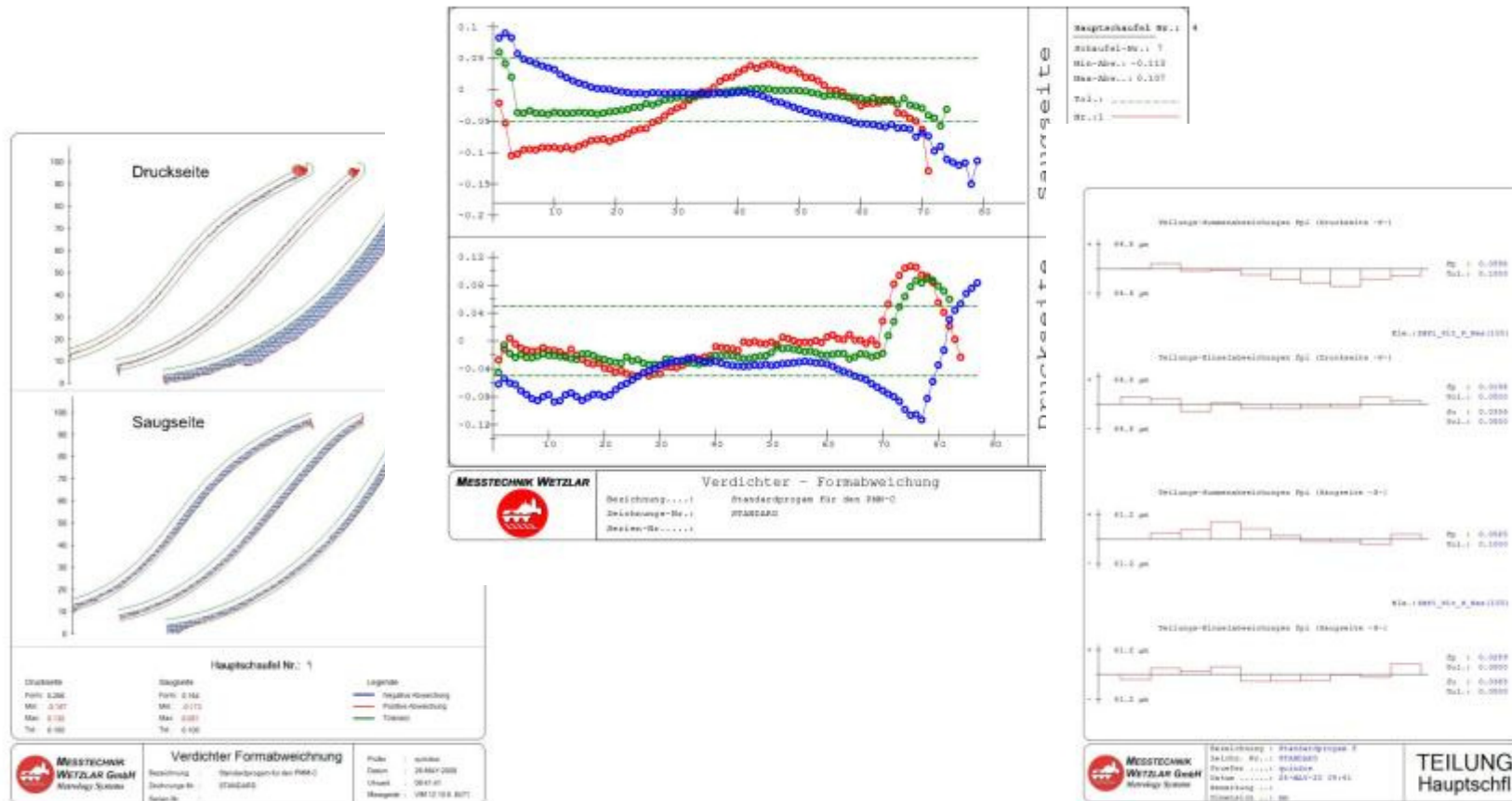




# Impeller



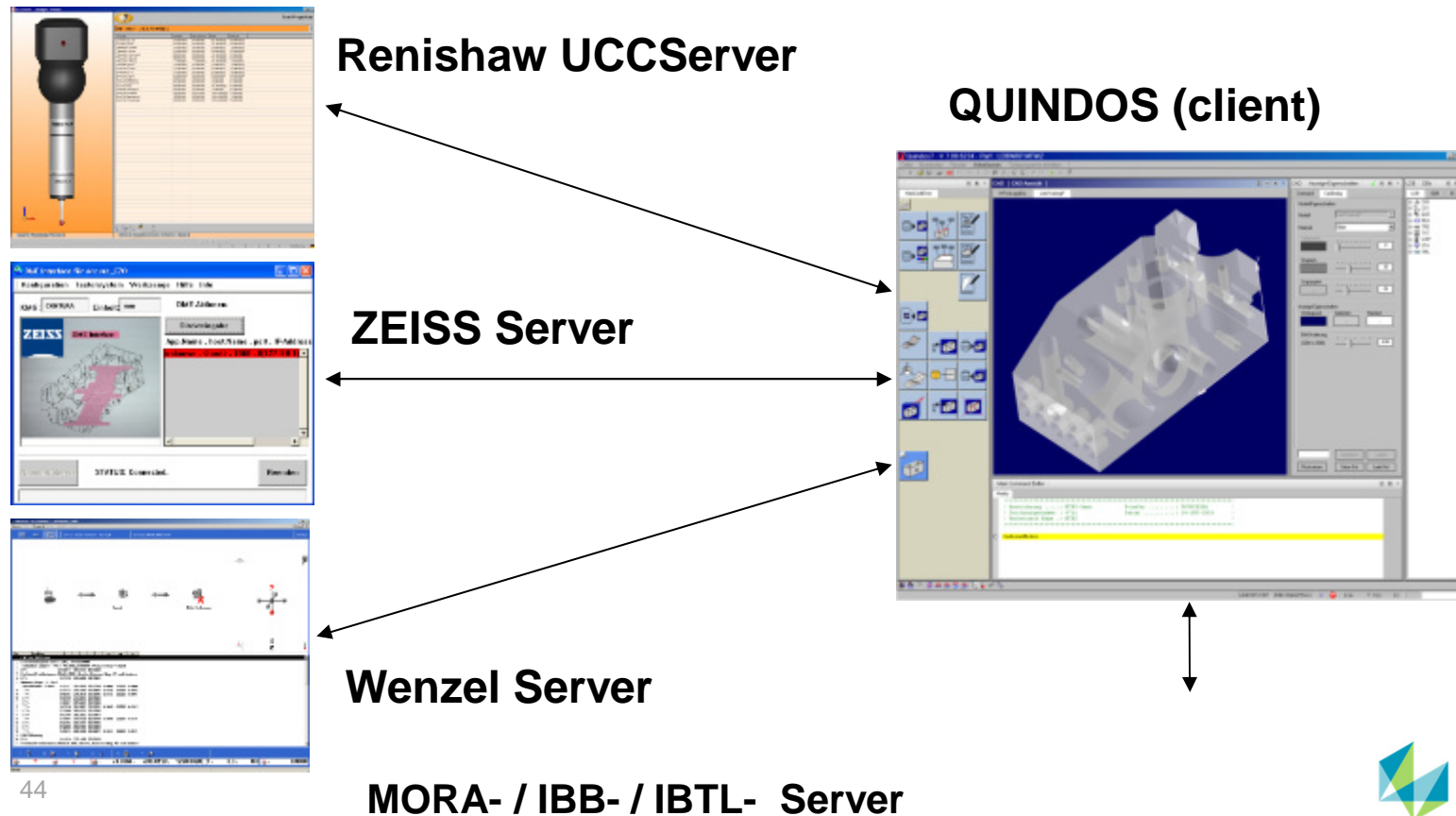
# Impeller



## 3rd Party I++DMEServer + client

### “IppDME“ Protocol (CMM-Interface => industrial Standard)

Quindos 7 is working exclusively with the new standard I++DME protocol to control any brand of CMM. Machines running the Leitz protocol are still compatible due to the I++Server provided with Quindos.



## Q7 PowerTrain & special Options

### •Gearings

- Cylindrical Gear
- Unknown Gear
- Involute & Lead Master
- Straight Bevel Gear
- Spiral Bevel Gear
- Cylindrical Worm
- Worm Wheel
- Double enveloping Worm
- Sprocket

### •Gear Tools

- Hob Cutter
- Broach Shells
- Shaver Cutter
- Shaper Cutter

### •Ultimate Blade

- Blisk & Blade
- Broach for fir tree foot

### •Special Geometries

- Step Gearings
- Curvic coupling
- Screw Compressor
- Camshaft
- Constant Velocity Joint
- Valve Seats & Guides
- Ovality of Pistons
- Connecting Rods
- Crankshaft
- Abrasive wear
- P3G & P4C Polygon
- Thread / API Thread
- Complementary Cams
- Impeller

- Feature based Inspection
- Statistic
- CAD Basic & Surfaces
- 2D Gauging
- Centering of Balls in 3D-Contour

### •CMM verifications

- CMM verify (spec. hardware required)
- CMM test with ball/bore plates
- ISO 10360 -2/3/4/5

### •Special Interfaces

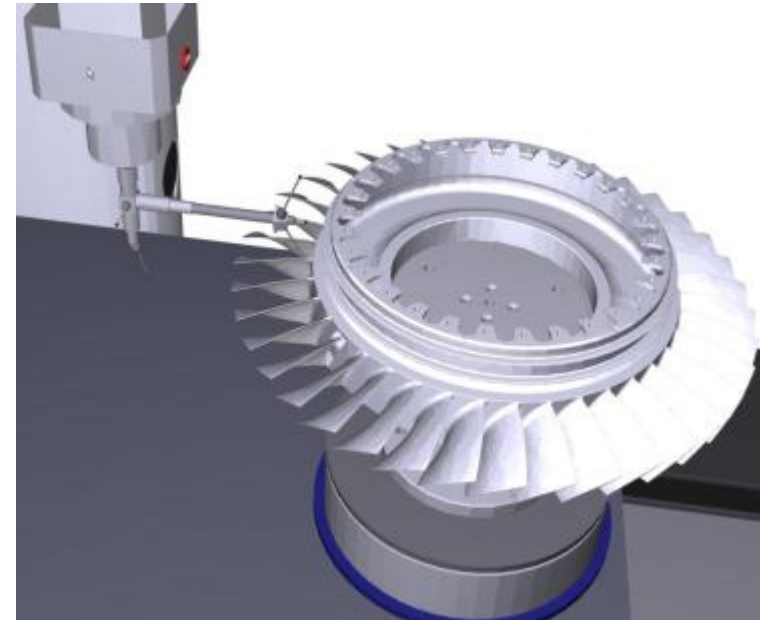
- qs-Stat<sup>®</sup> interface
- PRO-E, CATIAV4, CATIAV5, UG CAD interfaces
- FUBIT

### •Gauges

- Ring-Gauge
- Plug-Gauge
- Snap-Gauge
- Automatic Gauge inspection



## I++ Simulator



Please click on the image; Adobe Reader 8.0 is required